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United States
Department of
Agriculture

Forest Service

Tongass National Forest

R10-MB-384

March 1999



CAF/SK

Luck Lake Timber Sales

Draft Environmental Impact Statement

7 APR 99 10 36 AM
112 36 00 36 24





File Code: 1950

Date: February 24, 1999

Dear Planning Participant:

Enclosed is a copy of the Draft Environmental Impact Statement (EIS) for the Luck Lake Timber Sales in the Tongass National Forest. The entire EIS is included in one document, which describes one no-action alternative and five action alternatives ranging from 7.4 to 16.9 million board feet of harvest. Proposed harvest methods include partial cuts and clearcuts with reserve trees.

The comment period on the Draft EIS will be a minimum of 45 days from the date of publication on the notice of availability in the Federal Register, anticipated to be March 19, 1999. The deadline for comments is anticipated to be May 3, 1999. The completion date for the Final EIS is expected to be in summer 1999.

Federal court decisions have established that reviewers of a Draft EIS must structure their participation so that it is meaningful and alerts an agency to the reviewer's position and contentions. Environmental objections that could have been raised at the Draft stage may be waived if not raised until after completion of the Final EIS. This is so substantive comments and objections are made available to the Forest Service at a time when it can meaningfully consider them and respond to them in the Final EIS.

I am the responsible official for this project. As a result, I will be deciding whether or not timber harvest will occur in the Luck Lake project area at this time. Furthermore, if timber harvest does occur, I will be deciding where and how it occurs, where roads are developed, the access management strategy to be implemented, which strategy to implement for the placement of the small old-growth habitat reserves, and what mitigation measures are required.

Subsistence hearings will be held in Klawock, Thorne Bay, Coffman Cove, Whale Pass, Naukati, and Wrangell following a public meeting. Each subsistence hearing and public meeting will be preceded by an open house to answer any questions you may have. The schedule of hearings and open houses will be published in the *Ketchikan Daily News*, the *Island News*, and the *Wrangell Sentinel*.

You are encouraged to review and comment on the Draft EIS, as well as to participate in the subsistence hearings and open houses. Please send written comments to: Steve Kimball, District Ranger or Tom Ford, Team Leader, Attn.: Luck Lake EIS, USDA Forest Service, P.O. Box 19001, Thorne Bay, AK, 99919; or to the e-mail address: tford/r10_ketchikan_thornebay@fs.fed.us. You may also call (907) 828-3304 for additional information or if you would like additional copies of the Draft EIS.

Sincerely,

CAROL J. JORGENSEN
Assistant Forest Supervisor

Enclosure



Luck Lake Timber Sales

Draft Environmental Impact Statement

Ketchikan Area - Tongass National Forest USDA Forest Service, Alaska

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Abstract

The USDA Forest Service proposes to harvest approximately 18 million board feet (MMBF) of timber in the Luck Lake Project Area, Thorne Bay Ranger District, Tongass National Forest. Timber volume would be sold from this project in multiple sales of varying sizes. The actions analyzed in this EIS are designed to implement direction contained in the 1997 Tongass Land and Resource Management Plan. The Draft EIS describes six alternatives which provide different combinations of resource outputs and spatial locations of harvest units. All action alternatives propose adjusting the boundaries of one small reserve, and the boundaries and location of another to include more high-value winter habitat for deer (lower-elevation old-growth forest). Two adjustment scenarios have been proposed. Alternatives 2, 3, 4, and 5 include one scenario, while Alternative 6 includes the other. The alternatives include: 1) No-action, proposing no new harvest from the Project Area at this time; 2) minimizing potential effects to areas of key wildlife and fish habitat; 3) harvesting the most timber while minimizing new road construction; 4) (Proposed Action) maximizing the contribution to the timber products industry; 5) providing economically efficient timber sales; and 6) maximizing the contribution to the timber products industry.

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Summary

Proposed Action

The 35,509-acre Luck Lake Project Area is located approximately 17 air miles north of Thorne Bay, Alaska. It encompasses an area of north central Prince of Wales Island that extends from the community of Coffman Cove south to just north of Little Ratz Harbor. The Luck Lake Project Area is within the Thorne Bay Ranger District of the Tongass National Forest, Alaska. It includes value comparison units (VCU's) 572, 581, 582, and 583.

The Forest Service proposes to harvest up to approximately 18 MMBF of timber from 1,048 acres of National Forest land through a series of timber sales beginning in 1999. This would require about 15 miles of new road construction and 5 miles of road reconstruction. Logs would be transported to existing log transfer or processing facilities. Timber would be sold from this project in multiple sales of varying sale sizes.

As part of the Luck Lake Project, the boundaries and/or locations of two small old-growth habitat reserves will be adjusted for wildlife habitat considerations, resulting in a non-significant amendment to the 1997 Tongass Land and Resource Management Plan (Forest Plan). The proposed action also includes the development of an access management plan for the Project Area to guide current and future management of the road system.

Purpose and Need

The Luck Lake Project is proposed at this time to respond to goals and objectives of the Forest Plan, and to help fulfill desired future conditions described in that plan. The Forest Plan includes both forest-wide goals and objectives, and area-specific (land use designation) goals, objectives, and desired future conditions. Applicable forest-wide goals and objectives include:

1. Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner.
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle.
3. Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
4. Support a wide range of natural resource employment opportunities within Southeast Alaska's communities.

Four Forest Plan land use designations are within the Project Area. The goals of two of the four, Modified Landscape and Timber Production, are similar to the forest-wide goals and objectives listed above. For Timber Production, the desired future condition is to have healthy tree stands in a balanced mix of age classes from young stands to trees of harvestable age, and a road system providing access for timber management as well as recreation, hunting and fishing, and other public uses. Modified Landscape includes but modifies these desired conditions to take into account the scenic quality of foreground landscapes.

The third land use designation in the Project Area is Old-growth Habitat. Its primary goal is to maintain areas of old-growth forests to provide habitat for old-growth associated wildlife species. Within areas allocated to Old-growth Habitat, the desired condition is that all forested areas attain old-growth forest characteristics and provide a diversity of old-growth habitat types.

Summary

The fourth land use designation in the Project Area is Transportation/Utility System. Its goal is to provide for, and/or facilitate the development of, existing and future major public Transportation and Utility Systems, including those identified by the State of Alaska and the Alaska Energy Authority. Analysis of the state road corridor within this land use designation will not be included as part of the Luck Lake Project.

Project Issues

Significant issues for the Luck Lake Project were identified through public and internal scoping. The following five issues are addressed through the proposed action and alternatives.

Issue 1: High Value Wildlife and Fish Habitat

The Forest Plan includes a forest-wide network of old-growth habitat reserves, and detailed standards and guidelines specific to individual species and important habitat types. The application of some of this direction, as well as the need for additional measures, is left to project-specific analysis. This issue relates to maintaining the value and function of key local wildlife and fish habitats that support subsistence and related resources, including high value deer winter range and old-growth habitat connectivity. Within the Luck Lake drainage, the cumulative effects of previous timber harvesting in relation to its high subsistence and sports fish uses is also a concern.

Issue 2: Timber Sale Economics

This issue relates to the economic viability of proposed timber sales, and the potential employment and revenues generated by the project.

Issue 3: Timber Sale Size and Complexity

This issue relates to the ability of smaller companies to compete for timber sales in the Project Area. Higher volume sales coupled with extensive road construction may be beyond the means of smaller timber purchasers. Likewise, helicopter or large cable logging systems may also preclude all but the bigger purchasers.

Issue 4: New Road Construction

This issue relates to construction of roads into areas available for timber management but currently unroaded. Of particular concern is the Baird Peak area: whether or not a road should be built there, and if one is built, its management after completion of timber harvest.

Issue 5: Access Management

This issue relates to how all of the existing and proposed roads will be managed upon completion of timber harvesting, in particular, if they are to be left open or closed to public use. Access management considerations include resource needs, the cost of road maintenance, proximity to communities, and recreation and other uses desired by the public.

Alternatives

The proposed action and each action alternative provide a different response to the significant issues while still meeting the stated purpose and need. Each of these alternatives represents a site-specific proposal developed through intensive interdisciplinary team evaluation of timber harvest unit and road design, based on field verification.

The Forest Service uses many mitigation and preventive measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project, and continues through all phases of subsequent forest management and monitoring related to the project. The site-specific application of Forest Plan standards and guidelines and other mitigation measures are identified on the harvest unit and road cards for the project (located in Appendices B and C).

Each alternative complies with the Forest Plan conservation biology strategy designed to ensure well-distributed viable populations of wildlife. Each VCU in the Project Area includes a small old-growth habitat reserve; the boundaries of one small old-growth habitat reserve, and the boundaries and location of another, have been evaluated with interagency involvement and adjustments have been proposed to include more high-value winter habitat for deer (lower-elevation old-growth forest). Two adjustment scenarios have been proposed.

Alternatives 2, 3, 4, and 5 include one scenario, while Alternative 6 includes the other. All applicable Forest Plan standards and guidelines are incorporated, including those protecting beach and estuary fringe habitats, riparian areas, fisheries habitats, high-vulnerability karst resources, heritage (cultural and historical) resources, soil productivity, and water quality.

All roads have been located and will be designed to avoid or minimize effects on wetlands. Risks from windthrow have been evaluated, and means to minimize windthrow are incorporated into all harvest unit prescriptions. All units within the viewshed of a priority travel route or use area, as identified in the Forest Plan, have been designed to meet the visual quality objectives of the Modified Landscape Land Use Designation.

Alternatives to traditional clearcutting are prescribed for all harvest units. Proposed harvest units in VCU's 572 and 581 will meet the Forest Plan standards and guidelines for goshawks by leaving an average of 30 percent crown cover within units. Proposed harvest units in VCU 582 with high-value marten habitat are designed to meet Forest Plan standards and guidelines for marten by leaving 10 to 20 percent crown cover.

The proposed action (Alternative 4) and five alternatives are considered in detail. The general theme of each alternative is described below.

Alternative 1 (No-action)

Alternative 1 proposes no new timber harvest or road construction from the Luck Lake Project Area at this time. It does not preclude timber harvest from other areas at this time, or from the Luck Lake Project Area at some time in the future. Alternative 1 represents the existing condition against which all other alternatives are compared.

Alternative 2

The emphasis of this alternative is to minimize potential effects to areas of key wildlife and fish habitat not already covered by Forest Plan direction. Harvest and road construction in high value deer winter range and identified wildlife travel corridors are avoided or minimized. In the Luck Lake drainage, activities with potential to adversely affect downstream subsistence and sport fish resources are avoided.

Alternative 3 (Preferred)

The emphasis of this alternative is to harvest the most timber while minimizing new road construction. Units are included that can be: 1) helicopter-logged to existing or reconstructed roads, 2) cable-logged to existing roads, and 3) cable-logged to short or temporary new roads.

Alternative 4

The emphasis of this alternative, the project proposed action, is to make available the most timber volume that is feasible to harvest at this time while meeting all Forest Plan direction. The emphasis is to maximize the contribution of the Luck Lake Project Area to the timber products industry, and industry-related employment and income.

Alternative 5

The emphasis of this alternative is to provide economically-efficient timber harvesting and maximize opportunities for less costly small sales. Harvest of low-volume or low-value units is limited, as are investments in road access. The selection of logging systems is based primarily on economics.

Alternative 6

The emphasis of this alternative is to make available the most timber volume that is feasible to harvest at this time while meeting all Forest Plan direction. The emphasis is to maximize the contribution of the Luck Lake Project Area to the timber products industry, and industry-related employment and income. This alternative is identical to Alternative 4 with the exception that the old-growth habitat reserves located between Little Ratz Harbor and Coffman Cove do not cross the Transportation/Utility System corridor which connects Little Ratz and Coffman Cove.

Comparison of Alternatives

The table on the next page provides an overview of some of the outputs, activities or effects of the five action alternatives. Alternative 1 has no outputs or measurable effects.

Each alternative addresses the project issues differently. Following is a brief discussion of how the alternatives respond to the five significant issues. Frequent use is made of the information in the table.

Issue 1: High Value Wildlife and Fish Habitats

Alternative 1 has no timber harvesting. For all action alternatives, no timber harvest would occur in riparian or beach and estuary fringe habitats, and all harvest units will be partial cut, with the exception of one clearcut with reserves unit in Alternatives 4 and 6. The alternatives differ in the total amount of timber harvest and road construction proposed, with Alternatives 4 and 6 having the highest harvest (1,048 acres) and considerably more road construction (13.2 new road miles). Alternatives 2 and 5 are very similar in total harvest acres (464 and 431), but Alternative 2 has less road construction. Alternative 3 has the second highest harvest (857 acres) and the fewest new road miles (2.6).

In terms of selected key wildlife habitats or areas, Alternatives 2 and 5 show similar and consistently lower adverse effects than Alternatives 3, 4, and 6 which are also generally similar. Alternatives 3, 4, and 6 harvest roughly two-to-three times the amount of high-volume old growth, low-elevation old growth, and old-growth habitat in the Luck Lake drainage than do Alternatives 2 and 5. Alternatives 2, 4, and 6 have a smaller average unit size than Alternatives 3 and 5 (26/27/27 acres versus 34/36 acres), but Alternatives 4 and 6 have more than twice the number of units than does Alternative 2. Overall, Alternative 2 minimizes forest fragmentation in its combination of lower acres of harvest in key habitats, and fewer, smaller units, but is not substantially different than Alternative 5, which has fewer but larger units and similar harvested acres in key habitats.

Issue 2: Timber Sale Economics

Alternative 1 proposes no timber harvest, and thus offers no opportunity for timber-related employment or personal income. The action alternatives would result in timber-related employment opportunities in direct proportion to their total harvest volumes. Alternatives 4 and 6 offer the most timber volume (16.9 MMBF) and generate the highest potential number of jobs (110). These amounts are somewhat more than Alternative 3 (14.2 MMBF and 92 jobs) but over twice the amounts of Alternatives 2 or 5.

Alternative 3, which minimizes road construction, has the lowest average overall cost (\$236 per MBF), somewhat lower than Alternatives 2 and 5. Alternatives 4 and 6 have the highest average cost, which at \$397 per MBF is substantially higher than the other three action alternatives. These costs are largely related to road construction, as can be seen in the "harvest/mile of road" column in the table. Although Alternative 3 has a higher project cost than Alternative 2 or 5, it achieves 2.8 MMBF of harvest for every mile of road construction, twice the amount of Alternatives 2 and 5 (and three times that of Alternatives 4 and 6). Alternative 3 overall has the potential for offering the most economic sales.

Issue 3: Timber Sale Size and Complexity

Of the action alternatives, Alternative 5 is the only one with no helicopter logging, and has the least volume requiring either helicopter or "other" cable (generally long-span) logging systems. It thus offers the most economic logging system opportunities in proportion to its total harvest volume, but this is partly offset by the need for more road construction than Alternatives 2 and 3. Alternatives 4 and 6 have the highest harvest volume using running skyline, but also considerably more road construction.

Table Summary-1
Comparison of Action Alternatives - Outputs, Objectives and Effects

Category	Unit or Measure	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Harvest Method						
Clearcut w/ reserves	acres	0	0	21	0	21
Partial Cut	acres	464	857	1,027	431	1,027
Harvest Volume*	MMBF**	7.4	14.2	16.9	7.4	16.9
Harvest Units						
Number of units	#	18	25	39	12	39
Average unit size	acres	26	34	27	36	27
Harvest System*						
Running skyline	MMBF	3.3	4.3	6.1	3.9	6.1
Other Cable	MMBF	2.3	5.0	5.6	3.5	5.6
Helicopter	MMBF	1.8	4.9	5.2	0	5.2
Harvest of Key Habitats						
High-vol. old growth	acres	191	529	597	201	597
Old growth <1200 ft.	acres	271	540	653	377	653
Luck Lake drainage	acres	364	611	630	268	630
Roads						
New construction	miles	4.1	2.6	13.2	5.1	13.2
Reconstruction	miles	1.1	2.4	5.0	2.0	5.0
In Baird Peak area	miles	0.7	0	3.7	0	3.7
Timber Sales						
Number of sales	#	8	15	18	7	18
Average sale size	MMBF	0.93	0.87	0.94	1.06	0.94
Smallest sale	MMBF	0.14	0.04	0.04	0.65	0.04
Economics						
Total Project Cost	millions	\$2.2	\$3.4	\$7.1	\$2.2	\$7.1
Average harvest cost	\$/MBF	\$291	\$236	\$397	\$289	\$397
Net Value***	\$/MBF	\$31	\$47	-\$81	\$20	-\$81
Harvest/mile of road	MMBF	1.4	2.8	0.9	1.4	0.9
Employment	jobs/year	48	92	110	48	110

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

Alternatives 3, 4, and 6 have more individual sale opportunities (potentially divisible into 15 and 18 sales, respectively), the smallest of which would be only about 40,000 board feet, than Alternatives 2 and 5, and thus have more flexibility to provide a greater number of very small sale offerings. Alternatives 2, 3, 4, and 6 have similar average sale sizes, lower than Alternative 5 (at an average of 1.06 MMBF). Although it has the goal of providing less costly small sales, Alternative 5 has fewer options with only 7 potential sales, the smallest of which would be 650,000 board feet. Alternative 3 has the lowest average harvest cost of the action alternatives, and with its potential for several very small sale offerings has the most opportunities for small, relatively economical sales.

Issue 4: Timber Sale Road Construction

Alternative 3 has the least amount of new road construction (2.6 miles) and total construction and reconstruction (5.0 miles). Alternative 2 is comparable in overall road miles (5.2) but constructs 4.1 miles of new road, including 2/3-mile in the area of Baird Peak. Alternative 3 therefore opens the fewest areas to new road access. Alternatives 4 and 6 have considerably higher new road construction (13.2 miles) than the other alternatives, and would build 3.7 miles of road in the Baird Peak area. Neither Alternatives 3 or 5 build roads into the Baird Peak area.

Issue 5: Access Management

The potential long-term effects of the new road construction just discussed will be reduced through implementation of an access management plan for the Luck Lake Project Area. This plan differs by alternative only to the extent that the alternatives build different amounts of new roads, and the plan will close all newly-constructed roads at the end of the project. The access management strategy is to address and reduce, through road closures, some of the currently existing effects on wildlife and wildlife habitats, fisheries, and water quality, while leaving other roads open for public uses and future timber management. Based on an evaluation of resource concerns and potential impacts, the access management plan at this time proposes to close all newly constructed roads from the Luck Lake Project, and 19.6 miles of roads currently open. Another 26.3 miles of roads currently closed would remain so. After project completion, there will be 43.2 miles of forest system roads open to public uses.

Chapter 1

Purpose and Need

Chapter 1

Purpose and Need

Introduction

In compliance with the National Environmental Policy Act (NEPA) and other relevant State and Federal laws and regulations, the Forest Service has prepared this Environmental Impact Statement (EIS) on the potential effects of timber harvest in the Luck Lake Project Area (see Figure 1-1). The Project Area is located on Prince of Wales Island, and is within the Thorne Bay Ranger District, Tongass National Forest, Alaska. This EIS discloses the direct, indirect, and cumulative environmental impacts and any irreversible or irretrievable commitment of resources that would result from the proposed action and alternatives.

This EIS is prepared according to the format established by Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508). Chapter 1, in addition to explaining the purpose and need for the proposed action, discusses how the Luck Lake Project relates to the 1997 Tongass Land and Resource Management Plan (Forest Plan), and identifies the significant issues driving the EIS analysis. Chapter 2 describes and compares the proposed action, alternatives to the proposed action, and a no-action alternative. Chapter 3 describes the natural and human environments potentially affected by the proposed action and alternatives, and discloses what the potential effects are anticipated to be. Chapter 4 contains the list of preparers, the EIS distribution list, literature cited, a glossary, and an index. Appendix A discusses the reasons for scheduling the Luck Lake Project environmental analysis now. Other appendices provide additional information on specific aspects of the proposed project. Additional documentation may be found in the project planning record located at the Thorne Bay Ranger District Office in Thorne Bay, Alaska.

The Interdisciplinary Team (IDT) used a systematic approach for analyzing the proposed project and alternatives to it, estimate the environmental effects, and prepare this EIS. The planning process complies with NEPA and the CEQ regulations. Planning was coordinated with the appropriate federal, State, and local agencies, and local federally recognized tribes.

Proposed Action

The Forest Service proposes to harvest up to approximately 18 MMBF of timber from 1,048 acres of National Forest land through a series of timber sales beginning in 1999. This would require about 15 miles of new road construction and 5 miles of road reconstruction. Logs would be transported to existing log transfer or processing facilities. Timber would be sold from this project in multiple sales of varying sale sizes. In addition, the boundaries and/or locations of two small old-growth habitat reserves would be adjusted for wildlife habitat considerations, resulting in a non-significant amendment to the Forest Plan. The proposed

1 Purpose and Need

action also includes the development of an access management plan for the Project Area to guide current and future management of the road system.

Based on the environmental study and analysis in this EIS, the Tongass Forest Supervisor will decide whether and how to make timber available from the Luck Lake Project Area in accordance with Forest Plan goals, objectives and desired future conditions.

This decision will include:

- The estimated timber volume to make available from the Project Area at this time, and the number and size of the individual timber sales;
- The location, design, and schedule of timber harvest, silvicultural, road construction and reconstruction, and reforestation management practices;
- Access management measures (road, trail, and area restrictions and closures);
- Mitigation measures and monitoring requirements;
- Whether there may be a significant restriction on subsistence uses; and
- Whether to change the location of one or more of the small old-growth habitat reserves within the Project Area.

Project Area

The 35,509-acre Luck Lake Project Area is located approximately 17 air miles north of Thorne Bay, Alaska (Figure 1-1). It encompasses an area of north central Prince of Wales Island that extends from Coffman Cove south to just north of Little Ratz Harbor. It is located in the Coffman Creek, Eagle Creek, and Luck Creek watersheds. The community of Coffman Cove is located within and adjacent to the Project Area. Access to the area is by the Prince of Wales Island road system or by small plane originating in Ketchikan.

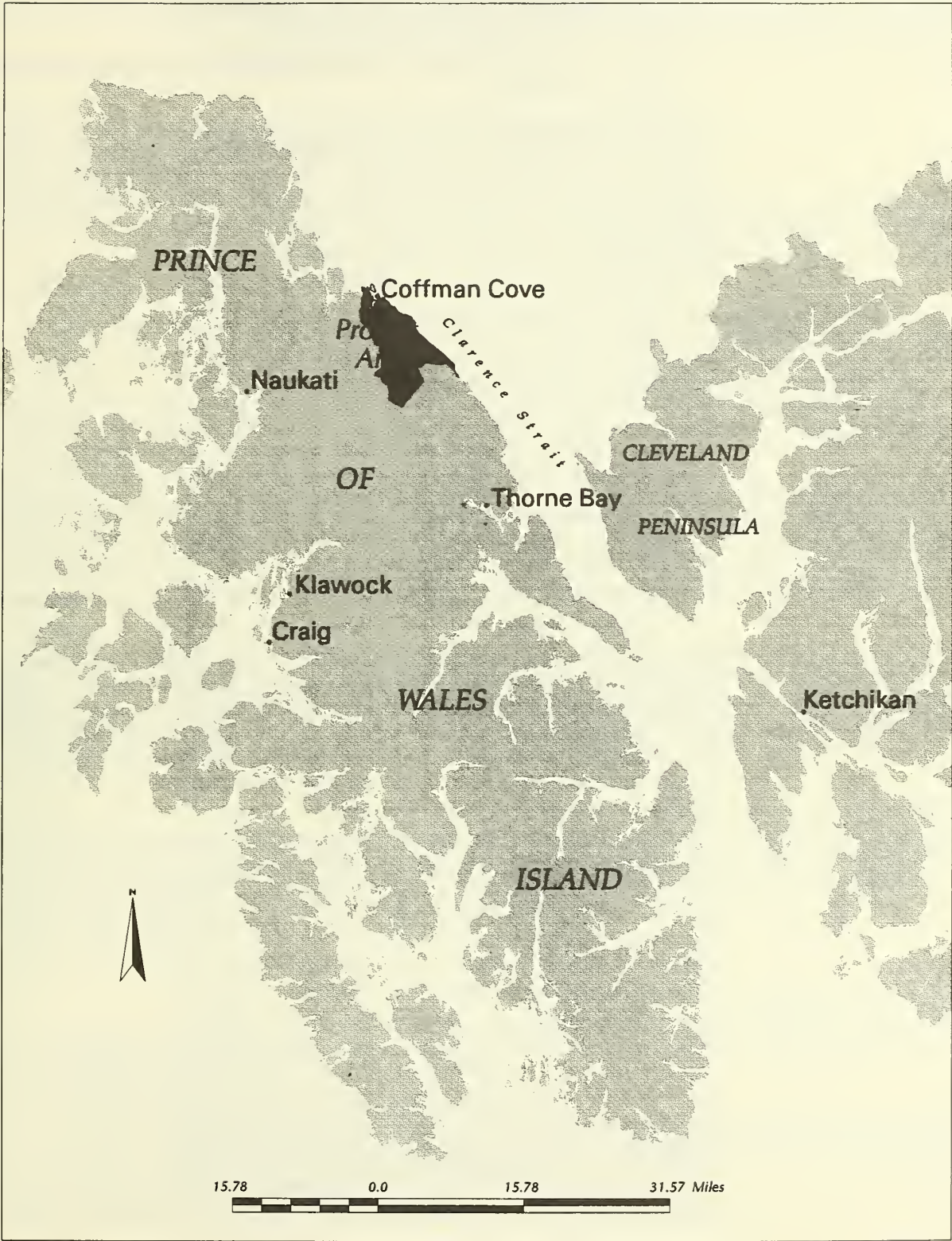
The Project Area includes value comparison units (VCU's) 572, 581, 582, and 583. VCU's are defined in the Introduction to Chapter 3. For analysis purposes, the Project Area boundaries are considered to be the same as the VCU boundaries, although these vary slightly along the western and southern boundaries of the Project Area. VCU boundaries generally follow major watershed divides. VCU's are delineated in Figure 1-2.

Purpose and Need

The Luck Lake Project is proposed at this time to respond to goals and objectives of the Forest Plan, and to help move the Project Area toward desired future conditions described in that plan. The Forest Plan includes both forest-wide goals and objectives, and area-specific (land use designation) goals, objectives, and desired future conditions. Applicable forest-wide goals and objectives (Forest Plan, pp. 2-3 and 2-4) include:

1. Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner.
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle.

Figure 1-1
Project Area Vicinity Map



1 Purpose and Need

3. Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
4. Support a wide range of natural resource employment opportunities within Southeast Alaska's communities.

The land use designations within the Project Area are described below under "Relationship to Forest Plan." The goals of two of the four (Modified Landscape and Timber Production) are similar to the forest-wide goals and objectives listed above; Modified Landscape also has the goal "to recognize the scenic values of suitable timber lands viewed from identified [places], and to modify timber harvest practices accordingly" (Forest Plan, p. 3-135). Applicable objectives common to these two designations include:

1. seek to reduce clearcutting when other methods will meet land management objectives,
2. improve timber growth and productivity on commercial forest lands, and
3. plan, inventory, prepare, offer, sell, and administer timber sales and permits to ensure the orderly development of timber production.

The third land use designation in the Project Area is Old-growth Habitat. Its primary goal is to "maintain areas of old-growth forests ... to provide habitat for old-growth associated resources" (Forest Plan, p. 3-76). Applicable objectives include:

1. Provide old-growth forest habitats, in combination with other land use designations, to maintain viable populations of ... fish and wildlife species ... that may be closely associated with old-growth forests.
2. Contribute to the habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses.

The fourth land use designation in the Project Area is Transportation/Utility System. Its goal is "to provide for, and/or facilitate the development of, existing and future major public Transportation and Utility Systems, including those identified by the State of Alaska and the Alaska Energy Authority" (Forest Plan, p. 3-158). The applicable objective for this project is: "...During the period before actual construction of the new system occurs, the management prescription(s) of the (initial) Land Use Designation(s) underlying the corridors will remain applicable" (Forest Plan, p. 3-158).

For Timber Production, the desired future condition includes healthy tree stands in a balanced mix of age classes from young stands to trees of harvestable age, and a road system providing access for timber management as well as recreation, hunting and fishing, and other public uses. Modified Landscape, as its name implies, includes but modifies these conditions to take into account the scenic quality of foreground landscapes. Within areas allocated to Old-growth Habitat, the desired condition is that all forested areas attain old-growth forest characteristics and provide a diversity of old-growth habitat types.

The Luck Lake Project will respond to these goals and objectives, and will help move the Project Area towards the desired future conditions of the land use designations. The project proposes timber harvesting on selected suitable timber lands for the production of sawtimber and other wood products, to help meet market demands for timber and provide resource production opportunities and employment for local communities. Harvest methods other than traditional clearcutting are proposed; harvest is expected to improve timber growth and contribute towards a balance of age classes. Three areas allocated to Old-growth Habitat as part of the forest-wide system of old-growth habitat reserves are included, and location and boundary changes for two of these are proposed to better protect key habitat for Sitka

black-tailed deer. Finally, the proposal includes development of a transportation access management plan covering the Project Area.

The state road corridor, proposed by the Forest Plan in the Transportation/Utility System Land Use Designation, will not be analyzed as a part of the Luck Lake Project. This corridor may be proposed as a separate project in the future. All analysis and public involvement would take place under that future proposal.

Relationship to Forest Plan

National forest planning takes place at several levels: national, regional, forest, and project levels. The Luck Lake EIS is a project-level analysis; its scope is confined to issues about the effects of the project. It does not attempt to address decisions made at higher levels. It does, however, implement direction provided at those higher levels.

The Forest Plan embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Tongass National Forest. The Forest Plan is a result of extensive analysis, which is addressed in the Forest Plan FEIS. When appropriate, the Luck Lake EIS tiers to the Forest Plan FEIS, as encouraged by 40 CFR 1502.20. Also, this EIS will incorporate documented analyses by summarizing and citing them, rather than repeating the entire analysis.

The Forest Plan uses land use designations to guide management of the national forest lands within the Tongass. Each designation provides for a unique combination of activities, practices and uses. The Luck Lake Project Area includes four land use designations, as just discussed. The goals of each are included below, and their locations are shown in Figure 1-2. The Forest Plan (Chapter 3) contains a detailed description of each land use designation.

Timber Production

The goals of this designation are to: 1) maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs; 2) manage these lands for sustained long-term timber yields; and 3) seek to provide a supply of timber from the Tongass National Forest which meets the annual and planning-cycle market demand, consistent with the standards and guidelines of this land use designation.

Modified Landscape

The goals of this designation repeat goals 1) and 3) under Timber Production, and include two others: provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments in the foreground distance zone; and, recognize the scenic values of suitable timber lands viewed from identified popular roads, trails, marine travel routes, recreation sites, bays, and anchorages, and ... modify timber harvest practices accordingly.

Old-growth Habitat

The goals of this designation are: 1) maintain areas of old-growth forests and their associated natural ecological processes to provide habitat for old-growth associated resources; and, 2) manage early seral conifer stands to achieve old-growth forest characteristic structure and composition based upon site capability.

Transportation and Utility System

The goal of this designation is to provide for, and/or facilitate the development of, existing and future major public Transportation and Utility Systems, including those identified by the State of Alaska and the Alaska Energy Authority.

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Other Land Status Within the Project Area

State and Private Lands

This is not a designation in the Forest Plan. However, for purposes of this EIS, it identifies lands within the Project Area which have been conveyed to the State or to Native corporations and are therefore not considered in the action alternatives of this project.

Table 1-1 gives the acreages within the Project Area of each land use designation, and of the State and private lands. Figure 1-2 displays the location of the land allocations and VCU's within the Project Area.

Table 1-1
Project Area Land Allocation Acreages (National Forest Acres)

Timber Production	Modified Landscape	Old-growth Habitat	T/U* System	State and Private Lands	Project Area Total
9,251	15,879	5,290	156	5,074	35,509

* T/U = Transportation/Utility

Key Forest-wide Standards and Guidelines in Project Area

The following standards and guidelines delineate spatial areas not available for programmed timber harvest within land use designations that are otherwise available. Each applies to a specific habitat or ecological component. These areas are included within the Modified Landscape and Timber Production designations described above. More detailed information about these and other standards and guidelines is included in the Forest Plan, Chapter 4.

Beach and Estuary Fringe

The beach and estuary fringe is an area of approximately 1,000 feet inland from mean high tide around all marine coastline. Programmed timber harvest is not allowed and roads are located outside the fringe when possible.

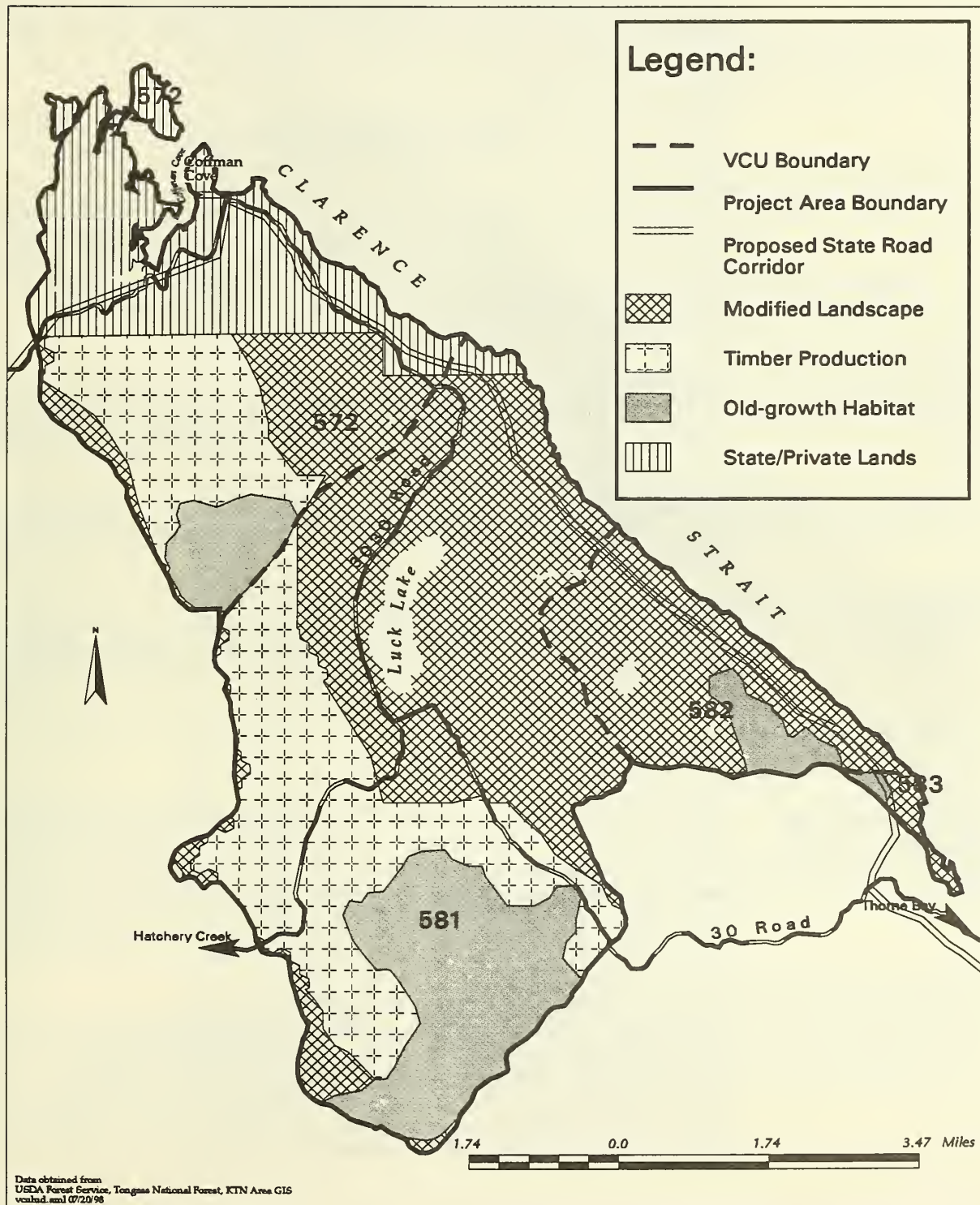
Karst and Caves

Potential karst areas have been identified, and these categorized as low, medium, or high vulnerability. High vulnerability areas are not suitable for programmed timber harvest.

Riparian

Riparian Management Areas are areas of special concern to fish, other aquatic resources, and wildlife. These areas are delineated according to the process group direction in the Riparian forest-wide standards and guidelines (Forest Plan, pp. 4-56 to 4-73). Some riparian boundaries may be adjusted after completion of a project-specific watershed analysis (Forest Plan, p. 4-56 and Appendix J). Timber harvest is not scheduled in Riparian Management Areas.

Figure 1-2
Luck Lake Project Area Land Use Allocations (as identified in the Forest Plan)



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Public Involvement

Scoping

The Council on Environmental Quality (CEQ) defines scoping as “...an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action” (40 CFR 1501.7). The scoping process was used to invite public participation and collect initial comments. The public was invited to participate in the project in the following ways.

Notice of Intent (NOI)

A Notice of Intent was published in the *Federal Register* on July 24, 1997, when it was decided that an EIS was to be completed for the project.

Public Mailing

In August, 1997, a letter providing information and seeking public comment (scoping document) was mailed to approximately 408 individuals and groups that had previously shown interest in Forest Service projects in Southeast Alaska. The mailing included 12 Federal agencies, 15 State agencies and divisions, 34 Native and municipal offices, and 97 businesses and other organizations and groups, in addition to individual citizens. Approximately 40 responses to this initial mailing were received.

Local News Media

Announcements about the project were printed in the *Ketchikan Daily News* and *Island News*. A scoping document describing the project was placed in the August 9-10, 1997, weekend edition of the *Ketchikan Daily News* and in the August 11, 1997, edition of the *Island News*.

Public Meetings

Public meetings were held in Thorne Bay, Whale Pass, Coffman Cove, Naukati, and Klawock to provide information and discuss potential areas of concern and/or interest that should be addressed in the Luck Lake Project.

Draft EIS

Availability of Draft EIS for Public Comment

Availability of this Draft EIS was announced in the *Federal Register* and through notices in local papers. These notices started a 45-day comment period. Documents were also mailed to Federal and State agencies, Native and municipal offices, and others who requested them.

Issues

Issues Associated with the Proposed Action

Significant issues for the Luck Lake Project were identified through public and internal scoping. Similar issues were combined into one statement where appropriate. The following five issues were determined to be significant and within the scope of the project decision. These issues are addressed through the proposed action and alternatives. Six additional concerns were considered but determined not to be significant for the project decisions to be made; they are either already resolved in the Forest Plan, or their resolution falls outside the scope of the Luck Lake Project.

Issue 1: High Value Wildlife and Fish Habitat

The Forest Plan includes a forest-wide network of old-growth habitat reserves, and detailed standards and guidelines specific to individual species and important habitat types. The application of some of this direction, as well as the need for additional measures, is left to project-specific analysis. This issue relates to maintaining the value and function of key local wildlife and fish habitats that support subsistence and related resources, including high value deer winter range, old-growth habitat connectivity, and cumulative effects within the Luck

Lake watershed due to the amount of previous harvest within that drainage and its high subsistence and sports fish uses.

Issue 2: Timber Sale Economics

This issue relates to the economic viability of proposed timber sales, and the potential employment and revenues generated by the project.

Issue 3: Timber Sale Size and Complexity

This issue relates to the ability of smaller companies to compete for timber sales in the Project Area. Higher volume sales coupled with extensive road construction may be beyond the means of smaller timber purchasers. Likewise, helicopter or large cable logging systems may also preclude all but the larger companies.

Issue 4: New Road Construction

This issue relates to construction of roads into areas available for timber management but currently unroaded. Of particular concern is the Baird Peak area: whether or not a road should be built there, and if one is built, its management after completion of timber harvest.

Issue 5: Access Management

This issue relates to how all of the existing and proposed roads will be managed upon completion of timber harvesting, in particular, if they are to be left open or closed to public use. Access management considerations include resource needs, the cost of road maintenance, proximity to communities, and recreation and other uses desired by the public.

Other Concerns

The following public concerns were considered but determined not to be significant issues. Some are already addressed through other processes or in the Forest Plan, or their resolution is beyond the scope of this project.

A: Include Log Transfer Facility Permitting Process in EIS

Timber from the project is expected to go to existing permitted facilities. Permit renewal, ongoing permit administration, and monitoring are part of the ongoing operation of the facility.

B: Manage Value Comparison Unit 581 as a Community Use Area

The idea of Community Use Areas, as proposed by the State of Alaska, was considered in the revision of the Forest Plan and its allocation of land use designations. Concerns specific to high value fish and wildlife habitats are included in Issue 1 above.

C: Additional Protection is Needed for Marten

The Forest Plan has incorporated a comprehensive conservation biology strategy to assure species distribution and viability. The Forest Plan adopted additional standards and guidelines for the marten, to be applied in VCU's where high levels of timber harvest have occurred (Forest Plan, pp. 4-118 to 4-119). This project meets or exceeds the Forest Plan requirements.

D: Construction of Beach Road Between Ratz Harbor and Coffman Cove

This road is not reasonably foreseeable. It is not a part of this proposed action and will not be analyzed with this project.

E: Do Not Use a Predetermined Harvest Volume

The "Purpose and Need" section of this chapter discusses volume relationships related to the project. CEQ requires an implementable proposed action, which would include a volume. Other alternatives represent different responses to the significant issues identified above. Volumes of the alternatives are a result of responding in different ways to the purpose and need and the issues; they are not driven by the need for a specific amount of volume.

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F: Poaching

Poaching is an ongoing law enforcement issue beyond the scope of the project EIS. Poaching is regulated by existing laws. Access management prescriptions and strategies developed for the project (Issue 5) will include consideration of poaching.

Federal and State Permits, Licenses, and Certifications

To proceed with timber harvest as addressed in this EIS, various permits must be obtained from Federal and State agencies. Administrative actions on these permits would be initiated after the EIS is filed with the Environmental Protection Agency (EPA). The agencies and their responsibilities are listed below.

U.S. Army Corps of Engineers

- Approval of discharge of dredged or fill material into waters of the United States (Section 404 of the Clean Water Act of 1977, as amended).
- Approval of construction of structures or work in navigable waters of the United States (Section 10 of the Rivers and Harbors Act of 1899).

U.S. Environmental Protection Agency

- Storm water discharge permit.
- National Pollutant Discharge Elimination System review (Section 402 of the Clean Water Act).

State of Alaska, Department of Natural Resources

- Authorization for occupancy and use of tidelands and submerged lands.

State of Alaska, Department of Environmental Conservation

- Certification of compliance with Alaska Water Quality Standards (Section 401 Certification).
- Solid Waste Disposal Permit (Section 402 of the Clean Water Act).

U.S. Coast Guard

- Coast Guard Bridge Permit (in accordance with the General Bridge Act of 1946) required for all structures constructed across navigable waters of the U.S.

Legislation and Executive Orders Related to This EIS

Shown below is a brief list of laws pertaining to project-specific planning and environmental analysis on Federal lands. Some of the laws are specific to Alaska, while others pertain to all Federal lands.

- National Historic Preservation Act of 1966 (as amended)
- Wild and Scenic Rivers Act of 1968, amended 1986
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Clean Air Act of 1970 (as amended)
- Alaska Native Claims Settlement Act (ANCSA) of 1971

- Marine Mammal Protection Act of 1972
- Endangered Species Act (ESA) of 1973 (as amended)
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)
- National Forest Management Act (NFMA) of 1976 (as amended)
- Clean Water Act of 1977 (as amended)
- American Indian Religious Freedom Act of 1978
- Alaska Native Interest Lands Conservation Act (ANILCA) of 1980
- Archeological Resource Protection Act of 1980
- Cave Resource Protection Act of 1988
- Tongass Timber Reform Act (TTRA) of 1990
- Executive Order 11988 (floodplains)
- Executive Order 11990 (wetlands)
- Executive Order 11593 (cultural)
- Executive Order 12962 (aquatic systems and recreational fisheries)

In addition, the Coastal Zone Management Act (CZMA) of 1976, as amended, pertains to the preparation of an EIS. Federal lands are not included in the definition of the coastal zone as prescribed in the CZMA. However, the act requires that when Federal agencies conduct activities or developments that affect the Coastal Zone, that the activities or development be consistent to the maximum extent practicable with the approved State Coastal Management Program. This determination is made by the Forest Service.

The Alaska Coastal Management Plan incorporated the Alaska Forest Resources and Practices Act of 1979 standards and guidelines for timber harvesting and processing. The Forest Service standards and guidelines and mitigation measures described in Chapters 2 and 3 of this document meet or exceed State standards.

Availability of the Planning Record

An important consideration in preparation of this EIS has been reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The planning record is available upon issuance of this EIS, and is located at the Thorne Bay Ranger District office in Thorne Bay, Alaska. Other reference documents such as the Forest Plan, the Tongass Timber Reform Act, the Resources Planning Act, and the Alaska Regional Guide are available at public libraries around the region as well as at the Supervisor's Office in Ketchikan. The Forest Plan is also available on the internet and CD-ROM.

1 Purpose and Need

NOTES

Chapter 2

Alternatives

Chapter 2

Alternatives

Introduction

This chapter describes and compares the alternatives considered by the Forest Service for the Luck Lake Project. It includes a discussion of how alternatives were developed, an overview of mitigation measures, monitoring and other features common to all alternatives, a description and map of each alternative considered in detail, and a comparison of these alternatives focusing on the significant issues. It also identifies Alternative 3 as the preferred alternative. Chapter 2 is intended to present the alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).

Some of the information in Chapter 2 is summarized from Chapter 3, "Affected Environment and Environmental Consequences." Chapter 3 summarizes the scientific basis for establishing baselines and measuring the potential environmental consequences of each of the alternatives. For a full understanding of the effects of the alternatives, readers will need to consult Chapter 3.

Landscape Analysis

The Luck Lake Project Area (35,509 acres) is included in the larger Ratz planning area that has been shown on the Ketchikan Area multi-year timber sale plans for the last several years. The Ratz planning area encompasses 121,800 acres. In order to synthesize the various resource conditions, objectives, and opportunities, an interdisciplinary team (IDT) conducted a landscape analysis of the Ratz planning area. The landscape analysis identified logical "treatment" areas (silvicultural treatment accomplished through timber harvesting), and ranked these for consideration for timber harvest and environmental analysis. The Luck Lake area was given the highest priority for timber harvest consideration because of the number of potential acres suitable for timber harvest at this time. The current and desired future conditions of the landscape (see discussion of Purpose and Need in Chapter 1) were factors in this ranking. The Ratz Position Statement documents the landscape analysis process and is part of the Luck Lake EIS planning record.

The unit pool for the Luck Lake Project was based on the suitable and available commercial forest lands represented in the 1997 Tongass Land and Resource Management Plan (Forest Plan). A pool of potential units was then selected that reflects how much timber the Luck Lake Project Area could potentially provide at this time given the parameters of the Forest Plan. This preliminary harvest unit pool included somewhat more than 1,000 acres in 44

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potential units. Additional early analysis of this unit pool led to deferring or dropping several potential harvest units from further consideration for the Luck Lake Project. Some of these units could not be harvested without violating Forest Plan standards and guidelines, and some would require modifications to meet standards and guidelines that would make them uneconomical to harvest.

Based on short- and long-term landscape or resource objectives (see Chapter 1), the IDT assigned preliminary timber harvest prescriptions for each potential harvest unit. This unit pool and the roads needed to access the units were then evaluated in the field. This pool of units was also used for public scoping for the project, and was identified at that time as the proposed action. The proposed action for this EIS, as described in Chapter 1 and considered in detail as Alternative 4, has changed slightly from the one described during scoping as a result of the field analysis.

Potential harvest units were validated, modified, dropped and/or deferred based on findings of the field investigations. Modifications were based on meeting Forest Plan standards and guidelines; for instance, if an unknown stream or karst feature was discovered. Some units were adjusted to have more logical boundaries, and some expanded to prevent isolating timber stands from future harvest. The emphasis of the project on harvest methods other than clearcutting required adjusting many units, originally designed for clearcutting, to facilitate logging systems. This effort led to the current unit pool, 1,048 acres and 39 units, which is the basis for Alternative 4. All unit harvest prescriptions have been updated to reflect Forest Plan standard and guidelines, field investigations and IDT analysis, and to respond to public and interagency input. Potential harvest unit cards and related road cards are included as Appendices B and C of this document.

Development of Alternatives

The proposed action and each action alternative presented in this EIS provide a different response to the significant issues for the Luck Lake Project while still meeting the stated purpose and need (see Chapter 1). Each of these alternatives represents a site-specific proposal developed through intensive interdisciplinary team evaluation of timber harvest unit and road design, based on field verification. Unit identification and design also made use of high resolution topographic maps and aerial photos, and a large quantity of resource data available in geographic information system (GIS) format.

The IDT used information from the analysis of scoping comments, in conjunction with the field-verified pool of units for the Project Area, to formulate different alternative approaches (frameworks). Based on these frameworks, the IDT then assigned potential harvest units to each to create the various alternatives. For example, if a project issue was concern over the high cost of timber harvest operations, then an alternative that minimizes transportation costs by selecting units already accessed by roads might be developed. Preliminary analysis and management direction were used to further refine the alternatives described here for the Luck Lake Project.

As has been discussed, a number of individual potential units have been eliminated from consideration at this time. Other units have been deferred because of resource or economic concerns. However, no project alternatives (units grouped for a specific purpose) were formulated other than those considered here in detail.

Direction Common to All Alternatives

The Forest Service uses many mitigation and preventive measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project. These measures come from or link to the Forest Plan, and continue through all phases of subsequent forest management related to the project. Higher level direction is also contained in the Alaska (Forest Service Region 10) Regional Guide, and applicable Forest Service manuals and handbooks.

IDT specialists use on-the-ground inventories, computer inventories, and aerial photographs to prepare the documents called unit cards for each harvest unit in the unit pool for the alternatives. Cards are also prepared for each segment of road. Resource specialists include their concerns on the cards and then describe how the concerns can be addressed in the design of each unit and road segment. Resource concerns and mitigation measures will be refined further during final layout, when specialists have one more opportunity to revise their unit and road card recommendations.

Timber volumes used throughout the document are expressed in thousands of board feet (MBF's). The regional averages used to convert volumes from MBF's to hundreds of cubic feet (CCF's) follow:

Alaska yellowcedar and western redcedar, $CCF = MBF/0.45$.

Hemlock, $CCF = MBF/0.50$.

Sitka spruce, $CCF = MBF/0.57$.

Applicable Forest Plan standards and guidelines, Best Management Practices (BMP's), and other specific mitigation measures are identified on the harvest unit and road cards for the project (located in Appendices B and C). The following items are listed to highlight some of the key mitigation measures, findings, or processes applied to the project that are common to all alternatives; they are by no means a complete list. All alternatives have been analyzed for cumulative effects. This analysis includes National Forest lands, as well as adjoining State and private lands where applicable.

Standards and Guidelines

Biodiversity and Old Growth

Each alternative complies with the Forest Plan conservation biology strategy designed to ensure well-distributed viable populations of wildlife.

The small old-growth habitat reserves (Old-growth Habitat Land Use Designation) mapped in the Forest Plan FEIS have been evaluated for size, spacing, and habitat composition. The boundaries of one small old-growth habitat reserve, and the boundaries and location of another, have been evaluated with interagency involvement and adjustments have been proposed to include more high-value winter habitat for deer (lower-elevation old-growth forest). Two adjustment scenarios have been proposed. Alternatives 2, 3, 4, and 5 include one scenario, while Alternative 6 includes the other.

Fish and Marine Habitats

Forest Plan standards and guidelines for riparian areas apply to all lakes and streams within the Project Area.

Watershed analysis for the project has included landscape, watershed, and site-level considerations. No opportunities were identified for adjusting Riparian Management Area boundaries.

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Road cards show which streams are likely to need special attention during implementation, such as the use of timing restrictions for in-stream activities, larger culverts, or bridges (Appendix C).

No new log transfer facilities will be required to implement this project. The log transfer facility (LTF) site at Thorne Bay could be used to implement any of the Luck Lake Project timber sales, and the LTF site at Coffman Cove might be available to implement these sales. The A-frame LTF's at Thorne Bay and Coffman Cove are being removed and cleaned up as part of the Ketchikan Pulp Company Long-term Contract Settlement Agreement. We anticipate that in the future, most logs will not be placed in the water at Thorne Bay but rather transported by methods such as barging. We also anticipate that the City of Coffman Cove may have a private LTF available at the Coffman Cove site in the future. Additionally, we expect that some logs will be transported to processing facilities on Prince of Wales Island and will not need to use LTF's.

Karst Resources

All activities have been designed to avoid high vulnerability karst, and to meet Forest Plan standards and guidelines for low and moderate vulnerability areas.

Heritage Resources

Forest Plan standards and guidelines for heritage resources state that the preferred management of sites listed in, nominated to, or eligible for the National Register of Historic Places is avoidance and protection (p. 4-15). Evaluation of the data collection needs and survey strategy is described a 1995 Agreement between the Forest Service Alaska Region, Alaska State Historic Preservation Office, and the Advisory Council on Historic Preservation (#95MOU-10-029). This agreement modifies the standard procedures described in Section 106 of the National Historic Preservation Act, 1966.

The Luck Lake Project Area lies entirely within the Central Prince of Wales (CPOW) Project Area, analyzed in 1992 and 1993. The reports documenting archaeological survey for CPOW state that at least 1,042 acres of proposed harvest and units were surveyed within VCU's 572, 573, and 581 prior to 1991. An additional 566 acres were surveyed during the CPOW planning process. These surveys resulted in the documentation of two modern/historic traplines consisting of alignments of blazed trees. No significant historic properties were discovered. (USDA FS CRM Reports 1993-05-01; 1993-05-01-09).

All planned management activities in the Luck Lake Project Area fall in low sensitivity areas for cultural resources as defined in the 1995 agreement (#95MOU-10-029); they lie at elevations above 100 feet and do not possess other characteristics which would suggest focused historic or prehistoric activities. The possibility that significant historic properties exist within the Area of Potential Effects for this project is very low. Clearance will be recommended based on a review of existing data. Following harvest, a sample of roads and units will be monitored to test the assumptions of the sensitivity model.

Scenery

All units within the viewshed of a priority travel route or use area, as identified in the Forest Plan, have been designed to meet the visual quality objectives of the Modified Landscape Land Use Designation.

Soils, Water Quality and Wetlands

All proposed activities upstream of Coffman Cove's water source have been designed to maintain State of Alaska Drinking Water Regulations and Water Quality Standards for water supply.

Potential harvest units with slopes greater than 72 percent have received an on-site analysis of slope and class IV channel stability, and an assessment of potential downstream effects. Only areas with low levels of risk are included in the unit pool.

Road locations avoid slopes greater than 67 percent, unstable areas, and slide-prone areas where it is feasible to do so.

All roads have been located and will be designed to avoid or minimize effects on wetlands.

Subsistence

All alternatives have been evaluated in compliance with ANILCA, Title VIII, Section 810.

Timber Harvesting

Alternatives to traditional clearcutting are prescribed for all harvest units. Types of harvest include partial cuts and clearcuts with reserve trees left inside the unit boundaries.

Risks from windthrow have been evaluated, and methods to minimize windthrow are incorporated into all harvest unit prescriptions.

Wildlife Habitat

The Forest Plan conservation biology strategy, including all species-specific standards and guidelines, is considered sufficient to maintain habitat for viable populations for all species potentially within the Project Area.

Proposed harvest units in VCU's 572 and 581 will meet the Forest Plan standards and guidelines for goshawks by leaving an average of 30 percent crown cover within units.

Proposed harvest units in VCU 582 with high-value marten habitat are designed to meet Forest Plan standards and guidelines for marten.

Monitoring

Monitoring activities can be divided into three broad categories: Forest Plan monitoring, routine implementation monitoring, and project-specific effectiveness monitoring. The National Forest Management Act requires that National Forests monitor and evaluate their forest plans (36 CFR 219.11). The Forest Plan (Chapter 6) includes the monitoring and evaluation activities to be conducted as part of Forest Plan implementation. At this time, no project-specific effectiveness monitoring needs have been identified for the Luck Lake Project.

Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of harvest units and roads (see previous discussion of mitigation). The unit and road cards (Appendices B and C) will be the basis for determining whether recommendations were implemented for various aspects of the Luck Lake Project.

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards are incorporated into contract documents and then monitor performance relative to contract requirements. Input by resource staff specialists, such as fisheries biologists, soil scientists, hydrologists and engineers, is regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

Tongass staff annually conduct a review of BMP implementation and effectiveness. The results of this and other monitoring are summarized in Tongass National Forest Annual Monitoring and Evaluation Reports. This report provides information about how well the

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management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities and effects.

Project-specific Effectiveness Monitoring

Effectiveness monitoring seeks answers about the effectiveness of design features or mitigation measures in protecting natural resources and their beneficial uses. Monitoring records will be kept by the responsible staff.

Post-Construction Road Monitoring

Objective: Evaluate the sensitivity model currently being used to design archaeological survey coverage (USDA FS Agreement #95MOU-10-029) for projects in the Alaska Region by post-construction archaeological monitoring of a small percentage (less than 20%) of roads.

Desired Results: At present the road corridors in low sensitivity zones have been cleared on the basis of a review of existing literature and an examination of the results of past archaeological survey projects. We expect monitoring of a sample of the roads constructed for the Luck Lake Project will not reveal any exposed historic or archaeological properties. However, should significant properties be discovered during monitoring, appropriate mitigative measures will be implemented and the sensitivity zone model will be reevaluated.

Measurement: Monitoring will be accomplished by walking the newly constructed road corridor and examining cutbanks and areas of disturbance. Any historic or archaeological materials (artifacts, features, or sites) discovered will be evaluated according to provisions of the National Historic Preservation Act applying National Register of Historic Places criteria of eligibility. Eligible and potentially eligible sites will receive mitigative treatment (data salvage and recovery). Discovery of any historic or prehistoric cultural resources will be cause for reevaluation of the sensitivity zone model and its application.

Responsible Staff: Craig and Thorne Bay Zone Archaeologist

Record of Results: The results of post-construction archaeological road monitoring will be reported in the Ketchikan Area's annual monitoring report and in the annual report to the Alaska SHPO.

Alternatives Considered in Detail

The proposed action (Alternative 4) and five alternatives are considered in detail. Alternative 1 is the no-action alternative, under which the Project Area would have no timber harvest or road construction at this time, and would remain subject to natural changes only. Alternatives 2, 3, 5 and 6 represent different means of satisfying the purpose and need than the proposed action, by responding with different emphases to the significant issues discussed in Chapter 1. Fold-out color maps of all alternatives considered in detail are provided at the end of Chapter 2. Larger-scale maps of the alternatives are contained in the project planning record.

Alternative 1 (No-action)

The emphasis of this alternative is to propose no new timber harvest or road construction from the Luck Lake Project Area at this time. It does not preclude timber harvest from other areas at this time, or from the Luck Lake Project Area at some time in the future. The three old-growth habitat reserves within the Project Area would remain in their current locations, as mapped in the Forest Plan. The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) require that a "No Action" alternative be analyzed in every EIS. This alternative represents the existing condition against which all other alternatives are compared. The Alternative 1 (Existing Condition) map shows the distribution of vegetation associated with no new timber harvest.

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Alternative 2

The emphasis of this alternative is to move the Project Area toward the Forest Plan's desired future conditions by minimizing potential effects to areas of key wildlife and fish habitat not already covered by Forest Plan direction. Harvest and road construction in high value deer winter range and identified wildlife travel corridors is avoided or minimized. In the Luck Lake drainage, activities with potential to adversely affect downstream subsistence and sport fish resources are avoided.

Alternative 2 would harvest 464 acres of commercial forest land in 18 harvest units producing 7.8 million board feet (MMBF) of timber. New road construction totals 4.1 miles.

Alternative 2 proposes harvest of 191 acres of high-volume productive old growth, and 271 acres of old-growth forest under 1,200 feet elevation. The average size of harvest units is 26 acres. In the Luck Lake drainage (VCU 581), 6.4 MMBF of timber harvest would occur on 364 acres.

Alternative 2 could be divided into as many as 8 timber sales, with an average size of 0.93 MMBF. The smallest offering would be 144,000 board feet. Average harvest costs would be \$291 per thousand board feet. Of this alternative's total harvest, 3.3 MMBF use less expensive running skyline harvest systems. On average, Alternative 2 harvests 1.4 MMBF for every mile of new and reconstructed road.

About 2/3-mile of road would be constructed in the Baird Peak area. After harvest activities are completed, all new project roads would be closed under the Luck Lake Access Management Plan.

Table 2-1
Alternative 2 - Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut w/ reserves	acres	0
Partial Cut	acres	464
Harvest Volume*	MMBF**	7.4
Harvest System*		
Running skyline	MMBF	3.3
Other Cable	MMBF	2.3
Helicopter	MMBF	1.8
Roads		
New construction	miles	4.1
Reconstruction	miles	1.1
Economics		
Total Project Cost	millions	\$2.2
Average harvest cost	\$/MBF	291
Net Stumpage Value***	\$/MBF	31
Employment	jobs/year	48

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

Alternative 3 (Preferred)

The emphasis of this alternative is to move the Project Area toward the Forest Plan's desired future conditions by harvesting the most timber while minimizing new road construction. Units are included that can be: 1) helicopter-logged to existing or reconstructed roads, 2) cable-logged to existing roads, and 3) cable-logged to short or temporary new roads.

Alternative 3 would harvest 857 acres of commercial forest land in 25 harvest units producing 14.2 million board feet (MMBF) of timber. New road construction totals 2.6 miles.

Alternative 3 proposes harvest of 529 acres of high-volume productive old growth, and 540 acres of old-growth forest under 1200 feet elevation. The average unit size is 34 acres. In the Luck Lake drainage (VCU 581), 10.9 MMBF of timber harvest would occur on 611 acres.

Alternative 3 could be divided into as many as 15 timber sales, with an average size of 0.87 MMBF. The smallest offering would be 40,000 board feet. Average harvest costs would be \$236 per thousand board feet. Of this alternative's total harvest, 4.3 MMBF use less expensive running skyline harvest systems. On average, Alternative 3 harvests 2.8 MMBF for every mile of new and reconstructed road.

No roads would be constructed in the Baird Peak area. After harvest activities are completed, all new project roads would be closed under the Luck Lake Access Management Plan.

Table 2-2
Alternative 3 - Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut w/ reserves	acres	0
Partial Cut	acres	857
Harvest Volume*	MMBF**	14.2
Harvest System*		
Running skyline	MMBF	4.3
Other Cable	MMBF	5.0
Helicopter	MMBF	4.9
Roads		
New construction	miles	2.6
Reconstruction	miles	2.4
Economics		
Total Project Cost	millions	\$3.4
Average harvest cost	\$/MBF	236
Net Stumpage Value***	\$/MBF	47
Employment	jobs/year	92

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

2 Alternatives

Alternative 4

The emphasis of this alternative, the project proposed action, is to move the Project Area toward the Forest Plan's desired future conditions by making available the most timber volume that is feasible to harvest at this time while meeting all Forest Plan direction. The emphasis is to maximize the contribution of the Luck Lake Project Area to the timber products industry, and industry-related employment and income.

Alternative 4 would harvest 1,048 acres of commercial forest land in 39 harvest units producing 16.9 million board feet (MMBF) of timber. New road construction totals 13.2 miles.

Alternative 4 proposes harvest of 597 acres of high-volume productive old growth, and 653 acres of old-growth forest under 1200 feet elevation. The average unit size is 27 acres. In the Luck Lake drainage (VCU 581), 11.1 MMBF of timber harvest would occur on 630 acres.

Alternative 4 could be divided into as many as 18 timber sales, with an average size of 0.94 MMBF. The smallest offering would be 42,000 board feet. Average harvest costs would be \$397 per thousand board feet. Of this alternative's total harvest, 6.1 MMBF use less expensive running skyline harvest systems. On average, Alternative 4 harvests 0.9 MMBF for every mile of new and reconstructed road.

About 3.7 miles of road would be constructed in the Baird Peak area. After harvest activities are completed, all new project roads would be closed under the Luck Lake Access Management Plan.

Table 2-3
Alternative 4 - Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut w/ reserves	acres	21
Partial Cut	acres	1,027
Harvest Volume*	MMBF**	16.9
Harvest System*		
Running skyline	MMBF	6.1
Other Cable	MMBF	5.6
Helicopter	MMBF	5.2
Roads		
New construction	miles	13.2
Reconstruction	miles	5.0
Economics		
Total Project Cost	millions	\$7.1
Average harvest cost	\$/MBF	397
Net Stumpage Value***	\$/MBF	-81
Employment	jobs/year	110

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

Alternative 5

The emphasis of this alternative is to move the Project Area toward the Forest Plan's desired future conditions by providing economically-efficient timber harvesting and maximize opportunities for less costly small sales. Harvest of low-volume or low-value units is limited, as are investments in road access. The selection of logging systems is based primarily on economics.

Alternative 5 would harvest 431 acres of commercial forest land in 12 harvest units producing 7.4 million board feet (MMBF) of timber. New road construction totals 5.1 miles.

Alternative 5 proposes harvest of 201 acres of high-volume productive old growth, and 377 acres of old-growth forest under 1200 feet elevation. The average unit size is 36 acres. In the Luck Lake drainage (VCU 581), 5.5 MMBF of timber harvest would occur on 268 acres.

Alternative 5 could be divided into as many as 7 timber sales, with an average size of 1.06 MMBF. The smallest offering would be 650,000 board feet. Average harvest costs would be \$289 per thousand board feet. Of this alternative's total harvest, 3.9 MMBF use less expensive running skyline harvest systems. On average, Alternative 5 harvests 1.4 MMBF for every mile of new and reconstructed road.

No roads would be constructed in the Baird Peak area. After harvest activities are completed, all new project roads would be closed under the Luck Lake Access Management Plan.

Table 2-4
Alternative 5 - Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut w/ reserves	acres	0
Partial Cut	acres	431
Harvest Volume*	MMBF**	7.4
Harvest System*		
Running skyline	MMBF	3.9
Other Cable	MMBF	3.5
Helicopter	MMBF	0
Roads		
New construction	miles	5.1
Reconstruction	miles	2.0
Economics		
Total Project Cost	millions	\$2.2
Average harvest cost	\$/MBF	289
Net Stumpage Value***	\$/MBF	20
Employment	jobs/year	48

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

2 Alternatives

Alternative 6

The emphasis of this alternative is to move the Project Area toward the Forest Plan's desired future conditions by making available the most timber volume that is feasible to harvest at this time while meeting all Forest Plan direction. The emphasis is to maximize the contribution of the Luck Lake Project Area to the timber products industry, and industry-related employment and income. This alternative is identical to Alternative 4 with the exception that the old-growth habitat reserves located between Little Ratz Harbor and Coffman Cove do not cross the Transportation/Utility System corridor which connects Little Ratz and Coffman Cove.

Alternative 6 would harvest 1,048 acres of commercial forest land in 39 harvest units producing 16.9 million board feet (MMBF) of timber. New road construction totals 13.2 miles.

Alternative 6 proposes harvest of 597 acres of high-volume productive old growth, and 653 acres of old-growth forest under 1200 feet elevation. The average unit size is 27 acres. In the Luck Lake drainage (VCU 581), 11.1 MMBF of timber harvest would occur on 630 acres.

Alternative 6 could be divided into as many as 18 timber sales, with an average size of 0.94 MMBF. The smallest offering would be 42,000 board feet. Average harvest costs would be \$397 per thousand board feet. Of this alternative's total harvest, 6.1 MMBF use less expensive running skyline harvest systems. On average, Alternative 6 harvests 0.9 MMBF for every mile of new and reconstructed road.

About 3.7 miles of road would be constructed in the Baird Peak area. After harvest activities are completed, all new project roads would be closed under the Luck Lake Access Management Plan.

Table 2-5
Alternative 6 - Harvest Objectives and Practices

Category	Unit or Measure	Amount
Harvest Method		
Clearcut w/ reserves	acres	21
Partial Cut	acres	1,027
Harvest Volume*	MMBF**	16.9
Harvest System*		
Running skyline	MMBF	6.1
Other Cable	MMBF	5.6
Helicopter	MMBF	5.2
Roads		
New construction	miles	13.2
Reconstruction	miles	5.0
Economics		
Total Project Cost	millions	\$7.1
Average harvest cost	\$/MBF	397
Net Stumpage Value***	\$/MBF	-81
Employment	jobs/year	110

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

Comparison of Alternatives

This section compares outputs, objectives and effects of the alternatives in terms of the significant issues for the Luck Lake Project. The discussions of effects are summarized from Chapter 3; for a full understanding of the effects, Chapter 3 should also be read. The table below provides an overview comparison of information from the alternative descriptions. This information will be used in the discussions which follow. The table does not include Alternative 1, which has no outputs, activities or effects.

Table 2-6
Comparison of Action Alternatives - Outputs, Objectives and Effects

Category	Unit or Measure	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Harvest Method						
Clearcut w/ reserves	acres	0	0	21	0	21
Partial Cut	acres	464	857	1,027	431	1,027
Harvest Volume*	MMBF**	7.4	14.2	16.9	7.4	16.9
Harvest Units						
Number of units	#	18	25	39	12	39
Average unit size	acres	26	34	27	36	27
Harvest System*						
Running skyline	MMBF	3.3	4.3	6.1	3.9	6.1
Other Cable	MMBF	2.3	5.0	5.6	3.5	5.6
Helicopter	MMBF	1.8	4.9	5.2	0	5.2
Harvest of Key Habitats						
High-vol. old growth	acres	191	529	597	201	597
Old growth <1200 ft.	acres	271	540	653	377	653
Luck Lake drainage	acres	364	611	630	268	630
Roads						
New construction	miles	4.1	2.6	13.2	5.1	13.2
Reconstruction	miles	1.1	2.4	5.0	2.0	5.0
In Baird Peak area	miles	0.7	0	3.7	0	3.7
Timber Sales						
Number of sales	#	8	15	18	7	18
Average sale size	MMBF	0.93	0.87	0.94	1.06	0.94
Smallest sale	MMBF	0.14	0.04	0.04	0.65	0.04
Economics						
Total Project Cost	millions	\$2.2	\$3.4	\$7.1	\$2.2	\$7.1
Average harvest cost	\$/MBF	\$291	\$236	\$397	\$289	\$397
Net Value***	\$/MBF	\$31	\$47	-\$81	\$20	-\$81
Harvest/mile of road	MMBF	1.4	2.8	0.9	1.4	0.9
Employment	jobs/year	48	92	110	48	110

* excluding incidental right-of-way volume

** MMBF = million board feet

*** at current market prices

2 Alternatives

Issue 1: High Value Wildlife and Fish Habitats

Alternative 1 has no timber harvest or road construction and in comparison with the other alternatives has no adverse effects to fish or wildlife habitats. All action alternatives incorporate and apply Forest Plan standards and guidelines for riparian areas, the beach and estuary fringe, goshawk and marten. No timber harvest would occur in riparian or beach and estuary fringe habitats in any alternative, all harvest units will be partial cut, with the exception of one clearcut with reserves unit in both Alternatives 4 and 6. Each VCU in the Project Area includes a small old-growth habitat reserve (Old-growth Habitat Land Use Designation), part of a forest-wide system of old-growth habitat reserves. All of the reserves have been evaluated with interagency involvement, and two reserves were adjusted to include more low-elevation deer winter habitat. Together these reserves encompass 6,150 forested acres, of which 3,677 is productive old-growth habitat.

The alternatives differ in the total amount of timber harvest and road construction proposed, with Alternatives 4 and 6 having the highest harvest (1,048 acres) and considerably more road construction (13.2 new road miles). Alternatives 2 and 5 are very similar in total harvest acres (464 and 431), but Alternative 2 has less road construction. Alternative 3 has the second highest harvest (857 acres) and the fewest new road miles (2.6).

In terms of selected key wildlife habitats or areas (see table), Alternatives 2 and 5 show similar and consistently lower adverse effects than Alternatives 3 and 4, which are also generally similar. Alternatives 3, 4, and 6 harvest roughly two-to-three times the amount of high-volume old growth, low-elevation old growth, and old-growth habitat in the Luck Lake drainage than do Alternatives 2 and 5. Alternatives 2, 4, and 6 have a smaller average unit size than Alternatives 3 and 5 (26/27/27 acres versus 34/36 acres), but Alternatives 4 and 6 have more than twice the number of units than does Alternative 2. Overall, Alternative 2 minimizes forest fragmentation in its combination of lower acres of harvest in key habitats, and fewer, smaller units, but is not substantially different than Alternative 5, which has fewer but larger units and similar harvested acres in key habitats.

Issue 2: Timber Sale Economics

Alternative 1 proposes no timber harvest, and thus offers no opportunity for timber-related employment or personal income. The action alternatives would result in timber-related employment opportunities in direct proportion to their total harvest volumes. Alternatives 4 and 6 offer the most timber volume (16.9 MMBF) and generate the highest potential number of jobs (110). These amounts are somewhat more than Alternative 3 (14.2 MMBF and 92 jobs) but over twice the amounts of Alternatives 2 or 5.

Alternative 3, which minimizes road construction, has the lowest average overall cost (\$236 per MBF), somewhat lower than Alternatives 2 and 5. Alternatives 4 and 6 have the highest average cost, which at \$397 per MBF is substantially higher than the other three action alternatives. These costs are largely related to road construction, as can be seen in the "harvest/mile of road" column in the table. Although Alternative 3 has a higher project cost than Alternative 2 or 5, it achieves 2.8 MMBF of harvest for every mile of road construction, twice the amount of Alternatives 2 and 5 (and three times that of Alternatives 4 and 6). Alternative 3 overall has the potential for offering the most economic sales.

Issue 3: Timber Sale Size and Complexity

Of the action alternatives, Alternative 5 is the only one with no helicopter logging, and has the lowest volume requiring "other" cable (generally long-span) logging systems. It thus offers the most economic logging system opportunities in proportion to its total harvest volume, but this is partly offset by the need for more road construction than Alternatives 2 and 3. Alternatives 4 and 6 have the highest harvest volume using running skyline, but also considerably more road construction.

Alternatives 3, 4, and 6 have the higher numbers of individual sale opportunities (potentially divisible into 15 and 18 sales, respectively), the smallest of which would be only about 40,000 board feet. Alternatives 2, 3, 4, and 6 have similar average sale sizes, lower than Alternative 5 (at an average of 1.06 MMBF). Alternatives 3, 4, and 6 thus have more flexibility to provide a greater number of very small sale offerings. As discussed under the previous issue, Alternative 3 minimizes road construction and has the lowest average harvest cost of the action alternatives, whereas Alternatives 4 and 6 have the highest average cost. Although it has the goal of providing less costly small sales, Alternative 5 has fewer options with only 7 potential sales, the smallest of which would be 650,000 board feet. Alternative 3 therefore presents the most opportunities for small, relatively economical sales.

Issue 4: Timber Sale Road Construction

Alternative 3 has the lowest amount of new road construction (2.6 miles) and the least total construction and reconstruction (5.0 miles). Alternative 2 is comparable in overall road miles (5.2) but constructs 4.1 miles of new road. Alternative 3 thus opens the fewest areas with new road access. Neither Alternatives 3 or 5 build roads into the Baird Peak area. Alternatives 4 and 6, which have considerably more new road construction (13.2 miles) than the other alternatives, would also build 3.7 miles of road in the Baird Peak area. Alternative 2 builds about 2/3-mile of road in that area.

Issue 5: Access Management

The potential long-term effects of the new road construction just discussed will be reduced through implementation of an access management plan for the Luck Lake Project Area. This plan differs by alternative only to the extent that the alternatives build different amounts of new roads, and the plan will close all newly-constructed roads at the end of the project. The access management strategy is to address and reduce, through road closures, some of the currently existing effects on wildlife and wildlife habitats, fisheries, and water quality, while leaving other roads open for public uses and future timber management. As the result of an evaluation of resource concerns and potential impacts, the access management plan proposes to close all newly constructed roads from the Luck Lake Project and another 19.6 miles of roads currently open. Another 26.3 miles of roads currently closed would remain so. When fully implemented, 43.2 miles of forest system roads will remain open to public uses.

Mitigation Measures

Many of the resource concerns raised during scoping, inter-agency discussions, and subsequent analysis did not become significant issues driving alternative development. Some of these concerns were addressed by eliminating potential harvest units from consideration at this time, and others have been, or will be, addressed during the design and implementation of the proposed activities. For example, various resource standards and guidelines from the Forest Plan, and the applicable BMP's used to meet requirements of the Clean Water Act, are automatically applied when potential harvest units or roads are located and designed. Also, based on resource analysis and/or interdisciplinary work, additional mitigation measures can be applied for specific proposed activities. Examples of these mitigation measures include:

- Unit 582-406 - 30% canopy retained to meet visuals standards and guidelines.
- Road construction is allowed in wetlands, but minimized.

Additional mitigation measures can be found on the unit and road cards (Appendices B and C).

2 Alternatives










NOTES

Luck Lake DEIS
Existing Environment
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

- | | | | |
|--|------------------------------------|---|----------------|
|  | Second Growth |  | Existing Roads |
|  | Low Volume Strata |  | Streams |
|  | Medium Volume Strata |  | VCU Boundaries |
|  | High Volume Strata | | |
|  | Other National Forest System Lands | | |
|  | State/Private Lands | | |



Project Vicinity Map



Data obtained from
USDA Forest Service, Tongass National Forest, KTN Area GIS
11/17/01 aml 07/08/98














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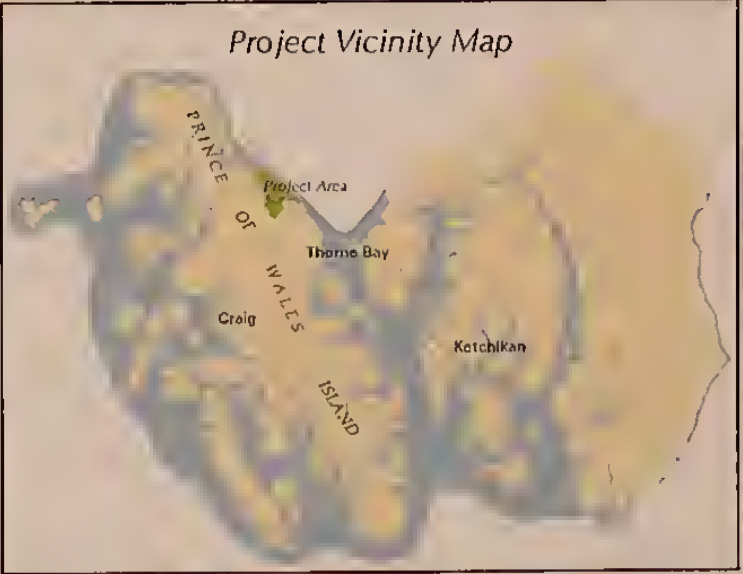
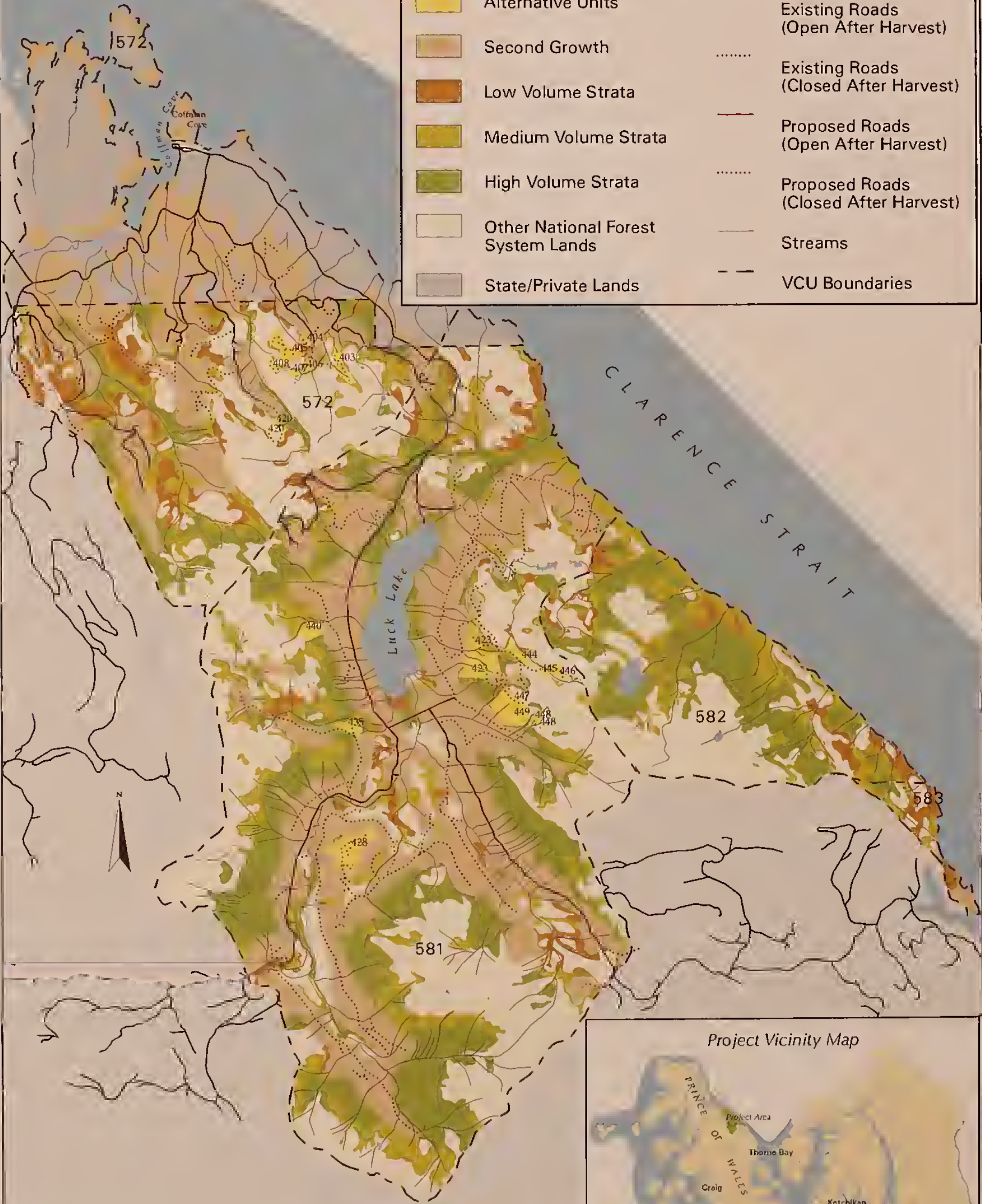
Luck Lake DEIS
Alternative 2
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

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|--|---------------------------------------|---|--|
|  | Alternative Units |  | Existing Roads
(Open After Harvest) |
|  | Second Growth |  | Existing Roads
(Closed After Harvest) |
|  | Low Volume Strata |  | Proposed Roads
(Open After Harvest) |
|  | Medium Volume Strata |  | Proposed Roads
(Closed After Harvest) |
|  | High Volume Strata |  | Streams |
|  | Other National Forest
System Lands |  | VCU Boundaries |
|  | State/Private Lands | | |



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Data obtained from
USDA Forest Service, Tongass National Forest, KTN Area GIS
11/17/01 and 07/08/98














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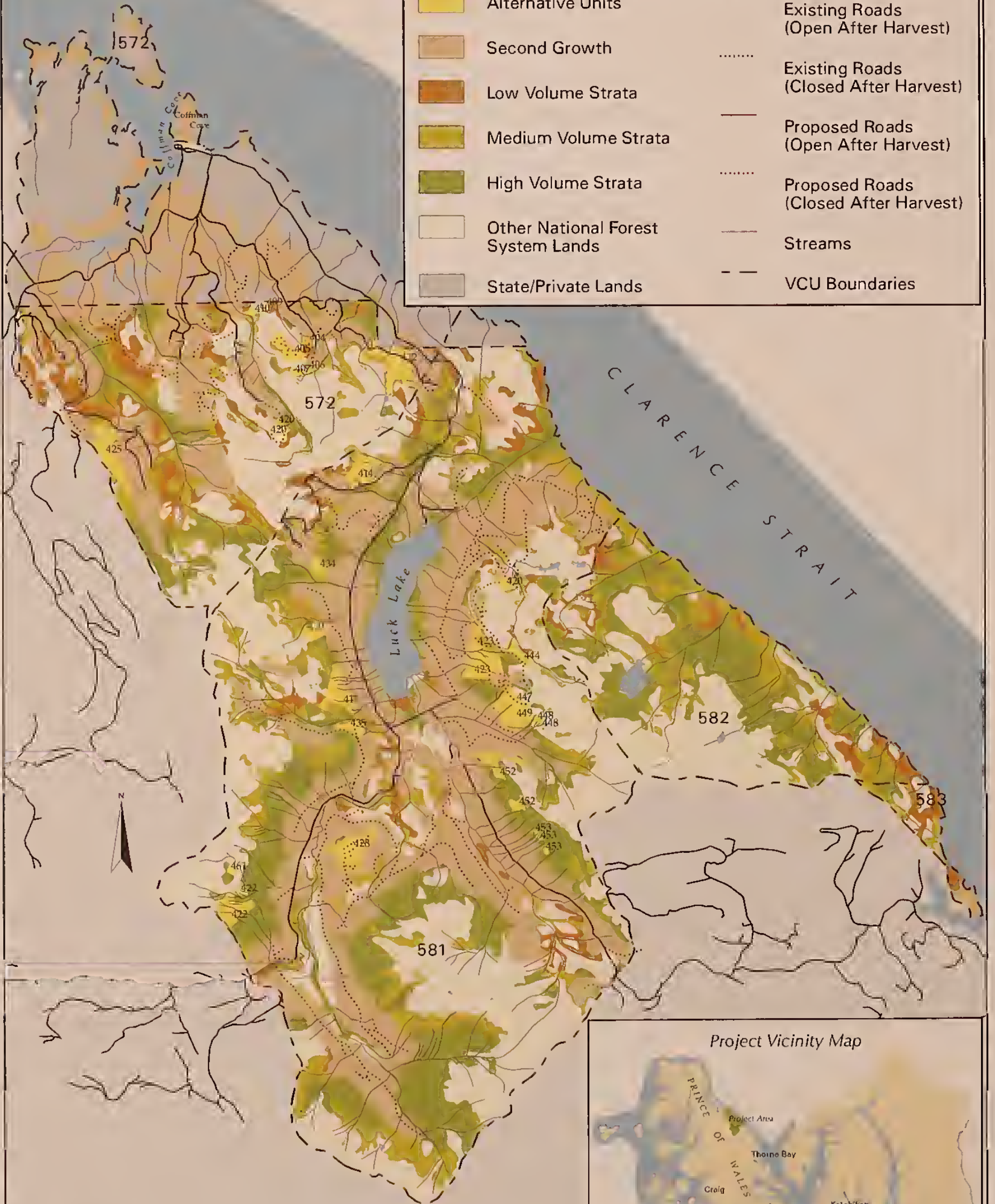
Luck Lake DEIS
Alternative 3
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

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|--|------------------------------------|---|---------------------------------------|
|  | Alternative Units |  | Existing Roads (Open After Harvest) |
|  | Second Growth |  | Existing Roads (Closed After Harvest) |
|  | Low Volume Strata |  | Proposed Roads (Open After Harvest) |
|  | Medium Volume Strata |  | Proposed Roads (Closed After Harvest) |
|  | High Volume Strata |  | Streams |
|  | Other National Forest System Lands |  | VCU Boundaries |
|  | State/Private Lands | | |



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Project Vicinity Map










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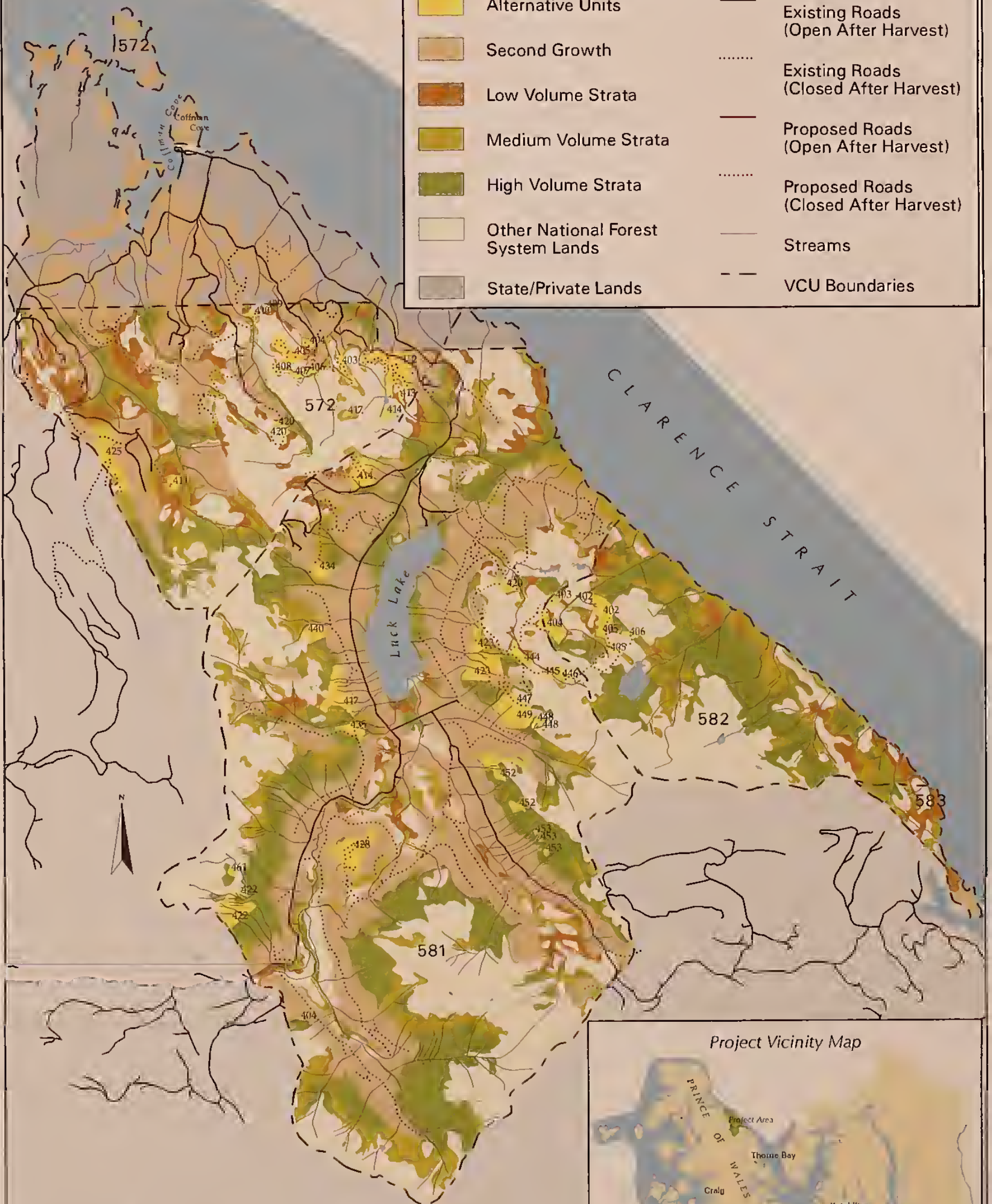
Luck Lake DEIS
Alternative 4
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

- | | | | |
|--|---------------------------------------|---|--|
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(Open After Harvest) |
|  | Second Growth | | Existing Roads
(Closed After Harvest) |
|  | Low Volume Strata | | Proposed Roads
(Open After Harvest) |
|  | Medium Volume Strata | | Proposed Roads
(Closed After Harvest) |
|  | High Volume Strata | | Streams |
|  | Other National Forest
System Lands | | VCU Boundaries |
|  | State/Private Lands | | |



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Project Vicinity Map
















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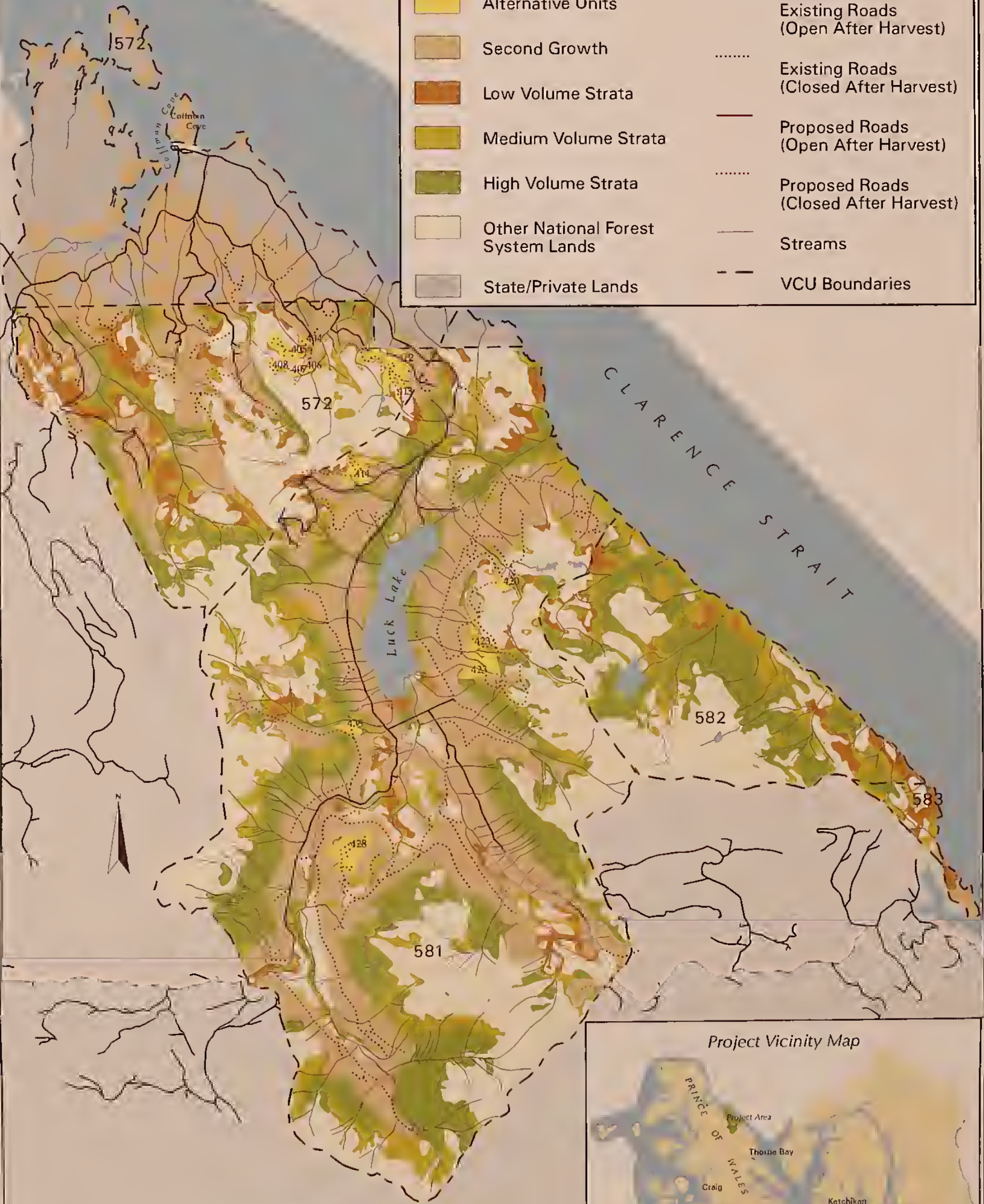
Luck Lake DEIS
Alternative 5
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

- | | | | |
|--|---------------------------------------|---|--|
|  | Alternative Units |  | Existing Roads
(Open After Harvest) |
|  | Second Growth |  | Existing Roads
(Closed After Harvest) |
|  | Low Volume Strata |  | Proposed Roads
(Open After Harvest) |
|  | Medium Volume Strata |  | Proposed Roads
(Closed After Harvest) |
|  | High Volume Strata |  | Streams |
|  | Other National Forest
System Lands |  | VCU Boundaries |
|  | State/Private Lands | | |



Data obtained from
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Project Vicinity Map
















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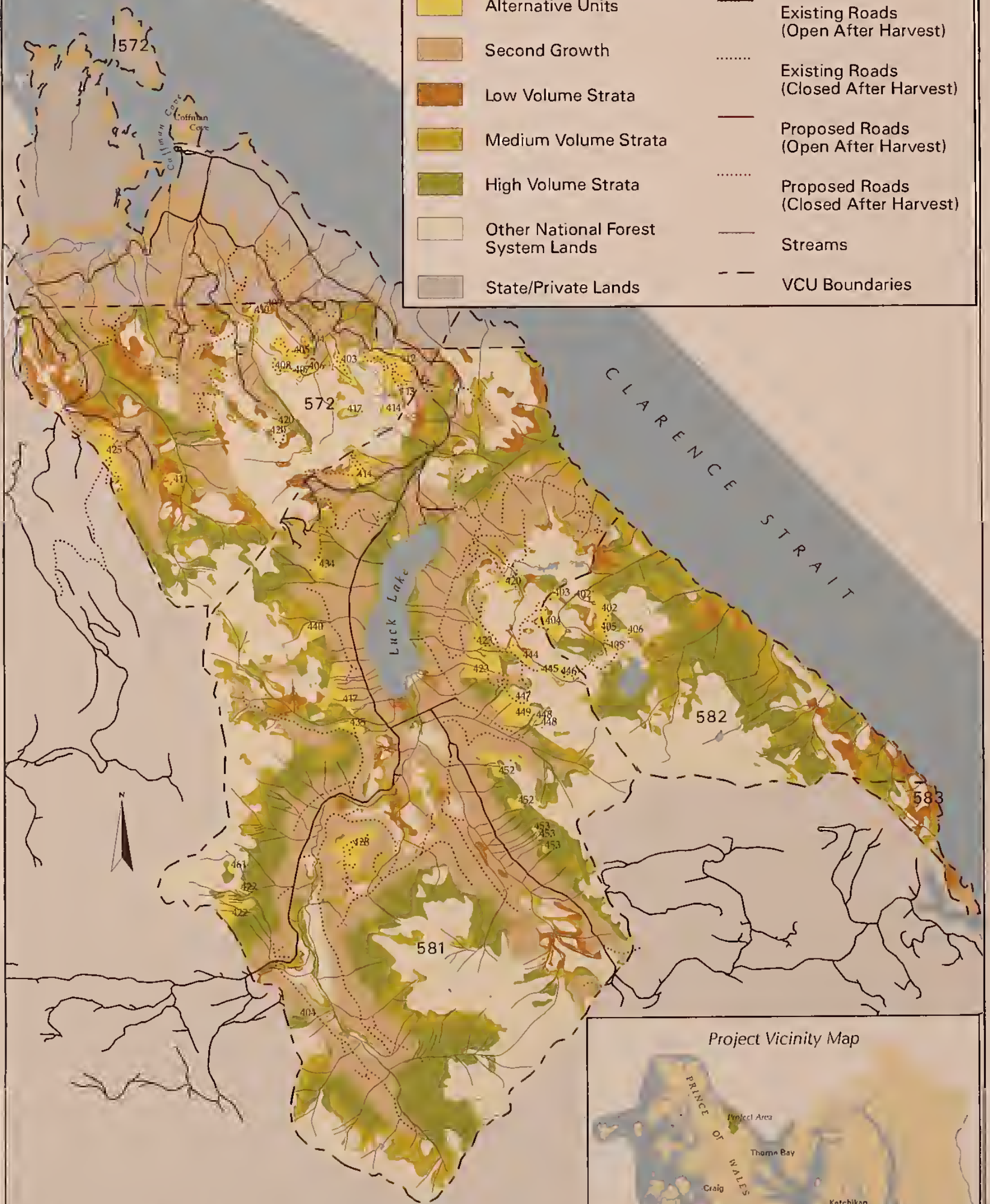
Luck Lake DEIS
Alternative 6
1998

U.S.D.A. Forest Service

Alaska Region

Luck Lake Project Area

- | | | | |
|--|---------------------------------------|---|--|
|  | Alternative Units |  | Existing Roads
(Open After Harvest) |
|  | Second Growth |  | Existing Roads
(Closed After Harvest) |
|  | Low Volume Strata |  | Proposed Roads
(Open After Harvest) |
|  | Medium Volume Strata |  | Proposed Roads
(Closed After Harvest) |
|  | High Volume Strata |  | Streams |
|  | Other National Forest
System Lands |  | VCU Boundaries |
|  | State/Private Lands | | |



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Chapter 3

Environment and Effects

Chapter 3

Affected Environment and Environmental Consequences

Introduction

This chapter provides information concerning the existing environment of the Luck Lake Project Area, and potential consequences to that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2. Each resource potentially affected by the proposed action or alternatives is described by its current condition and uses.

Following each resource description is a discussion of the potential effects (environmental consequences) to the resource associated with the implementation of each alternative. All significant or potentially significant effects, including direct, indirect and cumulative effects, are disclosed. Effects are quantified where possible, and qualitative discussions are also included. The means by which potential adverse effects will be reduced or mitigated are described.

The discussions of resources and potential effects take advantage of existing information included in the 1997 Tongass Land and Resource Management Plan (Forest Plan) FEIS, other project EIS's, project-specific resource reports and related information, and other sources as indicated. Where applicable, such information is briefly summarized and referenced to minimize duplication. The planning record for the Luck Lake Project includes all project-specific information, including resource reports, the watershed analysis, and other results of field investigations. The record also contains information resulting from public involvement efforts. The planning record is located at the Thorne Bay Ranger District Office in Thorne Bay, Alaska, and is available for review during regular business hours. Information from the record is available upon request.

Land Divisions

The land area of the Tongass National Forest has been divided in several different ways to describe the different resources and allow analysis of how they may be affected by Forest Plan and project level decisions. These divisions vary by resource since the relationship of each resource to geographic conditions and zones also varies. The allocation of Forest Plan

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land use designations (discussed in Chapter 1) is one such division. Two divisions important for the present effects analysis are described briefly here.

Value Comparison Units (VCU's)

These are distinct geographic areas, each encompassing a drainage basin containing one or more large stream systems. The boundaries usually follow major watershed divides. The Luck Lake Project Area consists of three VCU's, numbers 571, 581 and 582, as discussed in Chapter 1. Chapter 1 also includes a map showing their location.

Wildlife Analysis Areas (WAA's)

These are Forest Service land divisions that correspond to the "Minor Harvest Areas" used by the Alaska Department of Fish and Game. Approximately 190 apply to the Tongass National Forest. WAA 1420 corresponds to 97 percent of the Luck Lake Project Area. Information estimated by WAA is used in the wildlife and subsistence analyses.

Analyzing Effects

Environmental consequences are the effects of implementing an alternative on the physical, biological, social and economic environment. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) include a number of specific categories to use for the analysis of environmental consequences. Several are applicable to the analysis of the proposed project and alternatives, and form the basis of much of the analysis which follows. They are explained briefly here.

Direct, Indirect and Cumulative Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity, but would be significant in the foreseeable future. Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Unavoidable Adverse Effects

Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced, mitigated, or avoided by limiting the extent or duration of effects. The interdisciplinary procedure used to identify specific harvest units and roads was designed to eliminate or lessen the significant adverse consequences. The application of Forest Plan standards and guidelines, Best Management Practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter. Regardless of the use of these measures, some adverse effects will occur. The purpose of this chapter is to fully disclose these effects.

Short-term Use and Long-term Productivity

Short-term uses and their effects are those that occur annually or within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project has been implemented. Under the Multiple Use-Sustained Yield Act, and the National Forest Management Act, all renewable resources are to be managed in such a way that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be reestablished and grown again if the long-term productivity of the land is maintained. This long-term productivity is maintained through the application of the resource protection measures just

described, in particular those applying to the soil and water resources. These are also discussed throughout the chapter.

Irreversible and Irretrievable Commitments

Irreversible commitments are decisions affecting non-renewable resources such as soils, wetlands, unroaded areas, and cultural resources. Such commitments are considered irreversible because the resource has deteriorated to the point that renewal can occur only over a long period of time or at a great expense, or because the resource has been destroyed or removed. The construction of roads for timber harvesting is an irreversible action because of the time it takes for a constructed road to revert to natural conditions. The conversion of old-growth forest to a managed second-growth stand may also be considered an irreversible commitment.

Irretrievable commitments represent opportunities foregone for the period during which resource use or production cannot be realized. Such decisions are reversible, but the production opportunities foregone are irretrievable. As an example, deferring timber harvest at this time in certain areas due to resource concerns or economics would be an irretrievable commitment of timber volume otherwise obtainable. The commitment is irretrievable rather than irreversible, because future entries could harvest those areas if they are still part of the suitable timber base. Irreversible and irretrievable commitments are not usually identified as such in the resource discussion of this chapter.

Available Information

Much of the Tongass National Forest resource data resides in an electronic database formatted for a geographic information system (GIS). The Forest uses GIS software to assist in the analyses of these data. GIS data is available in tabular (numerical) format, and as plots displaying data in map format. For this EIS, all the maps, and most of the numerical analyses, are based on GIS resource data.

There is less than complete knowledge about many of the relationships and conditions of wildlife, fish, forests, jobs and communities. The ecology, inventory and management of a large forest area is a complex and developing science. The biology of wildlife species prompts questions about population dynamics and habitat relationships. The interaction of resource supply, the economy, and communities is the subject matter of an inexact science. However, the basic data and central relationships are sufficiently well established in the respective sciences for the deciding official to make a reasoned choice between the alternatives, and to adequately assess and disclose the possible adverse environmental consequences. New or improved information would be very unlikely to reverse or nullify these understood relationships.

Other Resources

Several resources and uses of the Project Area are likely to remain unaffected by the proposed action or alternatives, or will not be affected to a significant degree. Even though significant effects are not anticipated, most of these resources are discussed in the sections of this chapter which follow the introduction, to the extent that measurable effects or differences between alternatives are present. Resources or uses for which no measurable effects were identified are discussed briefly here.

Air Quality

All of the action alternatives will have limited, short-term effects on ambient air quality. Such effects, in the form of vehicle emissions and dust, are likely to be indistinguishable from other local sources of airborne particulates, including other motor vehicle emissions, dust from road construction and motor vehicle traffic, residential and commercial heating sources, marine traffic, and emissions from burning at sawmills. The action alternatives could result in short-term supplies of raw wood products to local mills. It is the responsibility of the mill owner or sort yard operator to ensure that mill emissions are within legal limits.

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Facilities

There are no logging camps or Forest Service administrative sites in the Luck Lake Project Area. The Thorne Bay Ranger District is located approximately 15 miles south of the Project Area in Thorne Bay, Alaska.

Heritage Resources

The Luck Lake Project Area falls within a region of Prince of Wales Island where considerable archaeological survey has been conducted, but very few archaeological or historic sites have been recorded. Several reasons may explain this situation. In the earlier periods of prehistory (10,000 to 5,000 years before present), this area may have been less hospitable to human occupation than other areas of the island due to harsh climatic conditions. In more recent ethnographic times, this steep section of the coast appears to have been little used by Native people. According to Goldschmidt and Haas (1946), who conducted interviews with Native informants in an effort to determine traditional land use patterns, the Luck Lake Project Area was within the territory of the kiks'adi people of the Stikine area. Haida use of this coast extended north on Prince of Wales Island only to Thorne Bay. Goldschmidt and Haas note significant settlements only in Thorne Bay and Coffman Cove (Goldschmidt and Haas 1946:130-131). In Coffman Cove itself, a significant archaeological site (Alaska Heritage Resource Survey #PET-067) has been studied. A recent management report (Reger 1995) by the State of Alaska Office of History and Archaeology notes that the site, likely the focus of seasonal activities, was occupied frequently between 4,000 and 800 years ago. However, Coffman Cove is outside this Project Area and, with the exception of one isolated artifact, no cultural resources are known within the Luck Lake Project Area.

All currently planned harvest and road construction activities in the Luck Lake Project Area will fall in low sensitivity areas for cultural resources: high elevations and steep slopes (#95MOU-10-029). Past archaeological survey in these areas has revealed no historic properties. It is expected that there will be no effect on cultural resources from the activities planned here. Post-construction monitoring of a sample of roads and units will be implemented to evaluate the sensitivity model.

Land Status

Under the Alaska Statehood Act of 1959, the State of Alaska is entitled to a certain amount of Federal land. The State was also allowed to identify for selection more acreage than would ultimately be conveyed to State ownership. Selected but as yet unconveyed lands within the Project Area are excluded from the proposed project and alternatives. Other legislation granted Alaska Native corporations similar selection rights. There are no Alaska Native land selections or claims within the Project Area.

Minerals

There are no known mineral occurrences of commercial value within the Luck Lake Project Area. Field investigations by the U.S. Bureau of Mines have located no mines or prospects, and only one minor copper occurrence is known. Bureau of Land Management records indicate no mining claims or patented mining claim groups within the Luck Lake Project Area.

The proposed action would have no direct or indirect impact on mineral resources. In general, the project would affect mining activities only by providing easier access for mapping and surveying due to new road construction in less developed or underdeveloped areas. Geologic mapping would also be enhanced by increased exposure due to road construction and quarry development.

Plans of Other Agencies

The CEQ regulations implementing NEPA require a determination of possible conflicts between the proposed action and the objectives of federal, State, and local land use plans, policies, and controls for the area. The major land use regulations of concern are Section 810

of the Alaska National Interest Lands Conservation Act (ANILCA), the Coastal Zone Management Act (CZMA), and the State of Alaska's Forest Practices Act. ANILCA Section 810 requirements pertain to subsistence; these are discussed in the Subsistence section of this chapter.

The CZMA was passed by Congress in 1976 and amended in 1990. This law requires federal agencies conducting activities or undertaking development affecting the coastal zone to ensure that the activities or developments are consistent with approved state coastal management programs to the maximum extent practicable. The State of Alaska passed the Alaska Coastal Management Act in 1977, to establish a program that meets the requirements of the CZMA. In 1990 the State passed a revised Alaska Forest Practices Act. For federal timber sales, the Forest Practices Act provides the standards to be used for a determination of consistency with the Alaska Coastal Management Act. It also provides specific stream buffer requirements.

The Forest Service has evaluated the alternatives to ensure that the activities and developments affecting the coastal zone are consistent with approved coastal management programs to the maximum extent practicable. The Forest Plan standards and guidelines, and management practices, incorporated into the Luck Lake Project meet or exceed those indicated by the Alaska Coastal Management Act and the Alaska Forest Practices Act. The layout of all proposed harvest units complies with Forest Plan standards and guidelines for riparian areas, which meet or exceed the stream buffer requirements in the Forest Practices Act.

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NOTES

Biodiversity and Old Growth

Affected Environment

Biological Diversity

National Forest Management Act (NFMA) regulations (36 CFR 219) define diversity as the distribution and abundance of different plant and animal communities and species. Biological diversity, or biodiversity, refers not only to the variety of organisms in an area; it also includes their genetic composition, the complex pathways that link organisms to one another and to the environment, and the processes that sustain the whole system. Biodiversity plays a key role in how well an ecosystem functions. It can be evaluated at different scales, ranging from genetic and species diversity to landscape diversity.

The risk of genetic and species loss is higher if the structure, composition, or function of habitats are compromised. An example of such a compromise might be fragmentation of large blocks of suitable habitat into smaller isolated blocks that separate small populations of wildlife species from each other. In managing forest ecosystems, biodiversity is evaluated at larger scales because the maintenance of functioning ecosystems will better conserve the species associated with them.

Prior to timber harvest, which began around 1954, the Project Area contained extensive amounts of unfragmented forest patches (blocks). Old-growth blocks have decreased in size and increased in frequency since that time, as timber harvest has resulted in fragmenting the larger blocks, and the total amount of old-growth forest has decreased. (Old-growth forest is discussed in more detail below.) Fragmentation of existing old growth results in a reduction in the effectiveness of remaining patches as wildlife habitat. Individual species respond to natural and human-induced fragmentation differently. Species like brown creepers and hairy woodpeckers can be supported by smaller patches of forest habitat than species such as deer and marten.

The connectivity, or habitat corridors, between habitat blocks in a landscape may be at least as significant to maintaining diversity as the size of the blocks (Noss 1983). Corridors can function in different ways, depending on width and other characteristics. Corridor width can be important: some "interior species" (species that do not inhabit the outer edges of old-growth forests) will not live in or even migrate through extensive lengths of unsuitable habitat (Forman and Gordon 1981). In the Project Area, connectivity along riparian areas, beach fringe, and between habitat at different elevations has been reduced by clearcutting within the watersheds. Prior to timber harvest activities, the main dispersal corridors throughout the Project Area were most likely along major creeks (Eagle and Luck Creeks) and near the beach.

Project Level Viability Analyses

The Forest Plan FEIS conducted viability analyses and concluded that the revised Forest Plan, as approved, will maintain viable and well-distributed populations of wildlife across the Tongass National Forest for 100 years. This analysis and conclusion incorporated the assumption of full implementation of the Forest Plan for 10 decades (harvest of all suitable acreage). Therefore, any project that is consistent with the Forest Plan is a subset of the forest-wide analysis and will, by definition, also maintain viable wildlife populations.

This project is located in the North Prince of Wales Biogeographic province. Specific measures were taken in the Forest Plan to maintain population viability within this province: 1) the size of the large and medium old-growth habitat reserves were enlarged above

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minimum requirements; 2) the reserves were specifically located to provide for connectivity from north to south and east to west (from Karta Wilderness to Port Protection); and 3) specific standards and guidelines were added for goshawks and martens in this province to prevent further fragmentation and provide habitat structure.

This project is consistent with the Forest Plan land allocations and standards and guidelines. Viability analyses are not required at the project level. New information has not emerged since the Forest Plan revision was completed that would cast doubt or significantly alter the original analysis. Within the 5-year timeframe of the mandated Forest Plan review and the commitment to review the old-growth strategy, new information should be available to conduct the review of population viability. During that review, conclusions may change. However, it is unlikely that before then, e.g. on an annual basis, any new information would be significant enough to modify the 100 year viability analysis conclusion.

Old-growth Forest

Old-growth forest contains trees of many ages, sizes, and conditions, including dead standing trees (snags) and trees with dead tops. Tree establishment largely depends on large woody debris (logs and stumps) (Harmon 1986, Harmon and Franklin 1989) and gap formation (Alaback 1988). Woody debris provides microsites for seedlings to grow on, and gaps (openings) created by windthrow or other disturbances allow light to penetrate to the forest floor. The process of trees dying and being replaced is continuous; in any one year, a portion of the trees in individual stands are likely to blow down (Harris 1989). Thus, the forest is a mosaic of older and younger trees, dynamically changing yet remaining stable as a forested ecosystem (Bormann and Likens 1979, Alaback 1988, Schoen et al. 1988, Franklin 1990).

Old-growth forest is an important source of valuable forest products. All action alternatives propose harvesting old-growth forest. Old-growth forests are important to many people for aesthetic and cultural purposes. Large trees, characteristic of many old-growth stands, have become symbols of a "pristine" landscape.

Old-growth forest is also important as wildlife habitat for old-growth associated species such as Sitka black-tailed deer, martens, black bears and Vancouver Canada geese, and cavity or snag-dependent species such as flying squirrels, woodpeckers, and owls. The combination of a dense canopy with scattered small openings (typically 20 to 40 feet across) allows forage to grow under the openings, while the large limbs within the canopy intercept enough snowfall to provide winter food and thermal cover for deer and other species. The large, dense stems also provide some measure of thermal insulation in the winter. Large dead or defective trees provide nesting sites for martens, owls, eagles, wrens and chickadees, as well as feeding sites for woodpeckers, sapsuckers, brown creepers and others.

The value of old-growth forest for wildlife habitat transcends individual stands. Large, contiguous, unfragmented blocks of old-growth forest are important to forest interior species. Large old-growth blocks provide expansive hunting territories and protection from predators, and promote genetic mixing among populations that would be less likely to breed if they were spatially separated by forest fragmentation. Deer use these large old-growth blocks for migration routes between winter and summer ranges.

Timber harvest of old-growth forest in the Project Area has occurred since about 1954. Table OG-1 displays information, by VCU, on the historic and existing amounts of old-growth forest in the Project Area. Old-growth forest is divided into productive and unproductive old growth; productive old growth (POG) are the areas (stands) of old-growth forest containing enough tree volume per acre to be commercially harvestable, and also considered to provide the more important wildlife habitat. POG existing in 1954 is estimated. The last column of the table represents the commercial old-growth forest that will be remaining at the end of the first rotation in land use designations classified as unsuitable for timber management.

Table OG-1
Old-growth Forest Acres

POG* (1954)	POG (1998)	POG (2054)
24,478	14,540	10,740

* POG = productive old growth (suitable and unsuitable)

Viable Populations and Old Growth

The NFMA regulations also include the concept of wildlife (vertebrate) species viability, requiring that fish and wildlife habitats be managed to maintain viable populations of species in the planning area (National Forest). A viable population is defined as one having "the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area" (36 CFR 219.19). Wildlife habitat planning and management for viable populations is carried out in the context of overall multiple-use objectives.

Viability is discussed here rather than in the Fisheries Resources and Wildlife sections due to the key role that old-growth forest habitat plays in maintaining viability across the Tongass National Forest. The Forest Plan includes, as the foundation of its viability strategy, a forest-wide system of old-growth habitat reserves (blocks) that maintain the integrity of the old-growth ecosystem.

Under the Forest Plan, Project Areas are not expected to independently maintain viable populations, but do need to consider project-level contributions to the forest-wide strategy. This includes maintaining the integrity of Old-growth Habitat Land Use Designations, maintaining other components of the overall strategy (such as riparian management areas, the beach and estuary fringe, and species-specific habitats), and considering additional old-growth habitat and corridor needs within the Project Area.

The Luck Lake Project Area neither contains nor is adjacent to any large or medium old-growth habitat reserves. It does contain three small reserves, one within each VCU, represented by the Old-growth Habitat Land Use Designation. The current locations of these reserves are displayed on the land use designation map in Chapter 1, Figure OG-1, and Figure OG-2, and their acreages and old-growth characteristics are displayed in Table OG-2. The Forest Plan requires a small old-growth habitat reserve be maintained in each VCU where larger reserves are not present (either under the Old-growth Habitat Land Use Designation or other non-development land use designations), and includes specific habitat criteria to follow in locating these reserves (Forest Plan, p. 4-120 and Appendix K). Although one small reserve, as required, is shown on the Forest Plan map, the plan allows boundary adjustments or relocations (within a VCU) of small reserves, as long as the habitat criteria are met. (Proposed changes to small old-growth habitat reserves are discussed below under "Effects of the Alternatives.")

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Table OG-2
Small Old-growth Habitat Reserves as Currently Mapped

VCU	VCU Acres	Small Old-growth Habitat Reserve Acres	POG* in Reserve (acres)	Minimum POG required
572	5,662	960	500	453
581	20,047	3,841	1,581	1,604
582	4,060	521	341	325

* POG = productive old growth

The maintenance of habitat corridors is important to minimize isolation and decline of wildlife species associated with the old-growth blocks (Harris 1984, 1985; Hunter 1990). Riparian areas, the beach fringe, estuaries and other areas (including stands deemed inoperable for timber harvest because of unstable soils, steep slopes, economic isolation, or other factors) can all provide connectivity between old-growth blocks. Timber harvesting (no longer allowed in these areas) occurred in the past within the beach, estuary, and riparian buffers in VCU's 572 and 581, and these areas all have gaps in connectivity. Over time, these sites will mature to again provide travel corridors for wildlife. A future old-growth habitat reserve strategy may include mature second-growth stands where they provide connectivity. The major beach fringe corridor east of Baird Peak, in VCU 582, remains intact.

Effects of the Alternatives

Effects of Alternatives on Old-growth Forest and Biodiversity

Following clearcut logging of old-growth forest, the stands that subsequently develop are even-aged (Harris and Farr 1974) and tend to contain a higher percentage of Sitka spruce and a lower percentage of the cedars. Clearcutting differs from natural disturbances in that it represents a large-scale change (up to 100 acres, typically) rather than dispersed small (one to 20 acres, typically) partial blowdown patches. It also differs in that nearly all trees are felled, whereas in natural disturbances many trees remain standing or partially standing (Hansen et al. 1991).

Direct Effects

The harvest units for all Luck Lake action alternatives differ from traditional clearcutting in that 10-30 percent of the timber of each unit will be retained. The retained trees will most likely be in clumps or "islands" within a unit, or may be more evenly spaced. In either case, the actual opening created will be smaller than the unit size, and mature trees will remain as part of the unit. Thus, all Luck Lake harvest units will more closely mimic stand structures developing after natural disturbance than if clearcut harvested.

Table OG-3 displays the average unit size and number of units for each alternative. Alternative 2 has the lowest average unit size and comes closest to matching the sizes of openings created by natural disturbance. The combination of smaller unit size and fewer units for Alternative 2 will result in relatively better connectivity remaining than in the other action alternatives. Alternatives 4 and 6 have a slightly higher average unit size and create more than twice the number of harvest openings as Alternative 2. Alternatives 3 and 5 have higher

average unit sizes. Alternative 5 has the fewest units overall, and based on number of units would create the least fragmentation.

Table OG-3
Harvest Unit Size by Alternative

Alternative	Number of Units	Average Unit Size (acres)
2	18	25
3	25	34
4	39	27
5	12	36
6	39	27

Indirect and Cumulative Effects

Table OG-1 portrays the amount of old-growth forest harvested to date within the Project Area, and gives an estimate of the productive old growth originally existing there. Comparing these two figures (for each VCU, and Project Area-wide) gives an indication of the cumulative effect (as a reduction) on the old-growth forest resource in the Project Area so far. VCU's 572 and 581 have relatively high percentages of cumulative harvest of productive old growth, high enough to invoke the Forest Plan standards and guidelines for the goshawk. VCU 582 has had no harvest to date.

Table OG-4 displays the anticipated harvest of productive old growth under each action alternative, by VCU and total for the Project Area. Alternative 1 (not shown) has no timber harvesting.

Table OG-4
Harvest Acres by VCU by Alternative

VCU	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
572	101	246	309	163	309
581	363	610	632	268	632
582	0	0	108	0	108
Total	464	856	1,049	431	1,049

Table OG-5 displays the cumulative change (reduction) in Project Area high-volume old-growth forest, as a percentage of that existing in 1954. Included are both the percentage harvested to date (which is the same for all alternatives), and the percentage resulting from the additional harvest under each Luck Lake action alternative.

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Table OG-5
Cumulative Reductions in Project Area High-Volume Old Growth:
Percentage of 1954 Productive Old-growth Forest Harvested

As of 1998	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	As of 2054
41%	44%	49%	50%	44%	50%	56%

An analysis of cumulative effects must also include "reasonably foreseeable future actions" (40 CFR 1508.7). For the Luck Lake Project action alternatives, individual sale offerings are likely to occur over the next ten years, and harvest activities may extend beyond that time. These are the only projects being planned for this area at this time. In adjacent areas, a small portion of the Control Lake timber sales project is planned in VCU 575, which borders VCU 581 for a short length along its western boundary; however, there are no units planned near the western boundary of VCU 581. Much of the rest of the Control Lake sales, and also the timber sales currently being planned in the Staney Creek area, are separated from the Luck Lake Project Area by the 160,000-acre Honker Divide Old-growth Habitat Land Use Designation. Therefore, the foregoing discussion of cumulative effects has included the reasonably foreseeable future actions.

To further address cumulative effects, potential harvest in the Luck Lake Project Area over the next five decades can be projected, on the assumption that the remaining available productive old growth will be harvested during that time (after which, the area's second-growth stands will be reaching harvestable age (80-100 years)). There are currently 2,765 acres of suitable productive old growth available for harvest scheduling (see Silviculture and Timber Management section of this chapter), of which the project alternatives would harvest between 431 and 1,048 acres, but assuming all are harvested by the end of five decades (by about 2050), this would reduce the productive old-growth forest in the planning area to 44 percent of what existed in 1954. Comparing this to the current percentage (Table OG-5), it can be seen that the majority of the potential cumulative effects (loss of productive old growth) have already occurred. In addition, assuming future harvest would fall under the current Forest Plan standards and guidelines, all future harvest would be done as partial cutting rather than clearcutting (representing essentially all of the harvest to date).

Effects Related to Viable Populations and Old Growth

The Forest Plan, as previously discussed, includes a forest-wide habitat conservation strategy designed to ensure adequate habitat to maintain viable fish and wildlife populations. For the Luck Lake Project Area, the three small old-growth habitat reserves are the main components of the forest-wide habitat conservation system. In addition, all applicable Forest Plan standards and guidelines that are also integral parts of the strategy - such as riparian management areas, beach fringe protection, landscape connectivity, and the goshawk and marten guidelines - are fully incorporated into the Luck Lake action alternatives.

The Forest Plan includes specific criteria for designing and locating small, medium and large old-growth habitat reserves (Forest Plan, Appendix K). As discussed earlier, the small old-growth habitat reserves identified and mapped for the Forest Plan are anticipated to be reviewed during project-level planning, and are subject to change to improve their functioning in the overall reserve system. The small old-growth habitat reserves in the Project Area were reviewed during several interagency and interdisciplinary meetings. Low elevation habitat, for deer winter range and other values, was not represented in the original designations. The Forest Plan old-growth habitat reserve criteria include as a factor to consider in locating reserves: "Important deer winter range to maintain important deer habitat capability to meet public demand for use of the deer resource" (Forest Plan, p. K-1). Although past timber

harvest precluded many opportunities for reserves in low elevation habitat, the changes proposed for the action alternatives are considered to better answer concerns about the distribution and connectivity of this habitat.

The mapped locations of the three Project Area small old-growth habitat reserves are shown in Figures OG-1 and OG-2. No changes are proposed for the small reserve in VCU 572. The boundaries of the reserve in VCU 581, and boundaries and location of the reserve in VCU 582 and 583, are proposed for change to incorporate more low-elevation productive old growth. The proposed acres in VCU 581 exceed the minimum required acres to compensate for the acres of habitat lost to existing roads and harvested units. Acres allocated to VCU 583 were mapped in adjacent VCU 582 to better meet the need for low-elevation habitat within the small old-growth habitat reserve. The changes for Alternatives 2-5 are displayed on Figure OG-1, and the changes for Alternative 6 are displayed on Figure OG-2. Table OG-6 displays information on the habitat composition of the new reserves in comparison with the Forest Plan mapped versions.

Table OG-6
Comparison of Mapped Small Old-growth Habitat Reserves and Proposed Reserves

	VCU 572	VCU 581	VCU 582	VCU 583
Small Reserve Acres:				
Forest Plan (1997)	960	3,841	521	1,623
Required (min.)	906	3,208	650	2,020
Proposed Change:**	none	3,947	1,243	975
POG* Acres:				
Forest Plan (1997)	500	1,581	341	962
Required (min.)	453	1,604	325	1,010
Proposed Change:**	none	2,190	987	664

* POG = productive old growth

** Acres will vary for Alternative 6. The small old-growth habitat reserves have been moved to exclude the state road corridor in the Transportation/Utility System Land Use Designation.

Comparison of Alternatives

Alternative 1 maintains current forest patch size and connectivity. Of the action alternatives, Alternative 5 maintains the most acreage in large old-growth patches. Alternative 2 avoids harvest in low elevation habitat (<1,200 ft.). Alternatives 4 and 6 comprise the most fragmentation (resulting in smaller patches) and harvest of old-growth forest. Alternative 3 exhibits similar effects to Alternatives 4 and 6, but comprises less road construction and less fragmentation of existing blocks. The proposed small old-growth habitat reserves in VCU's 581, 582, and 583 are located to exclude the Transportation/Utility Systems Land Use Designation (shown as the state road corridor in Chapter 1, Figure 1-2) in Alternative 6, resulting in fewer acres than the reserves proposed for Alternatives 2 through 5.

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Figure OG-1
Luck Lake Project Area Old-growth Habitat Reserves, Alternatives 2-5

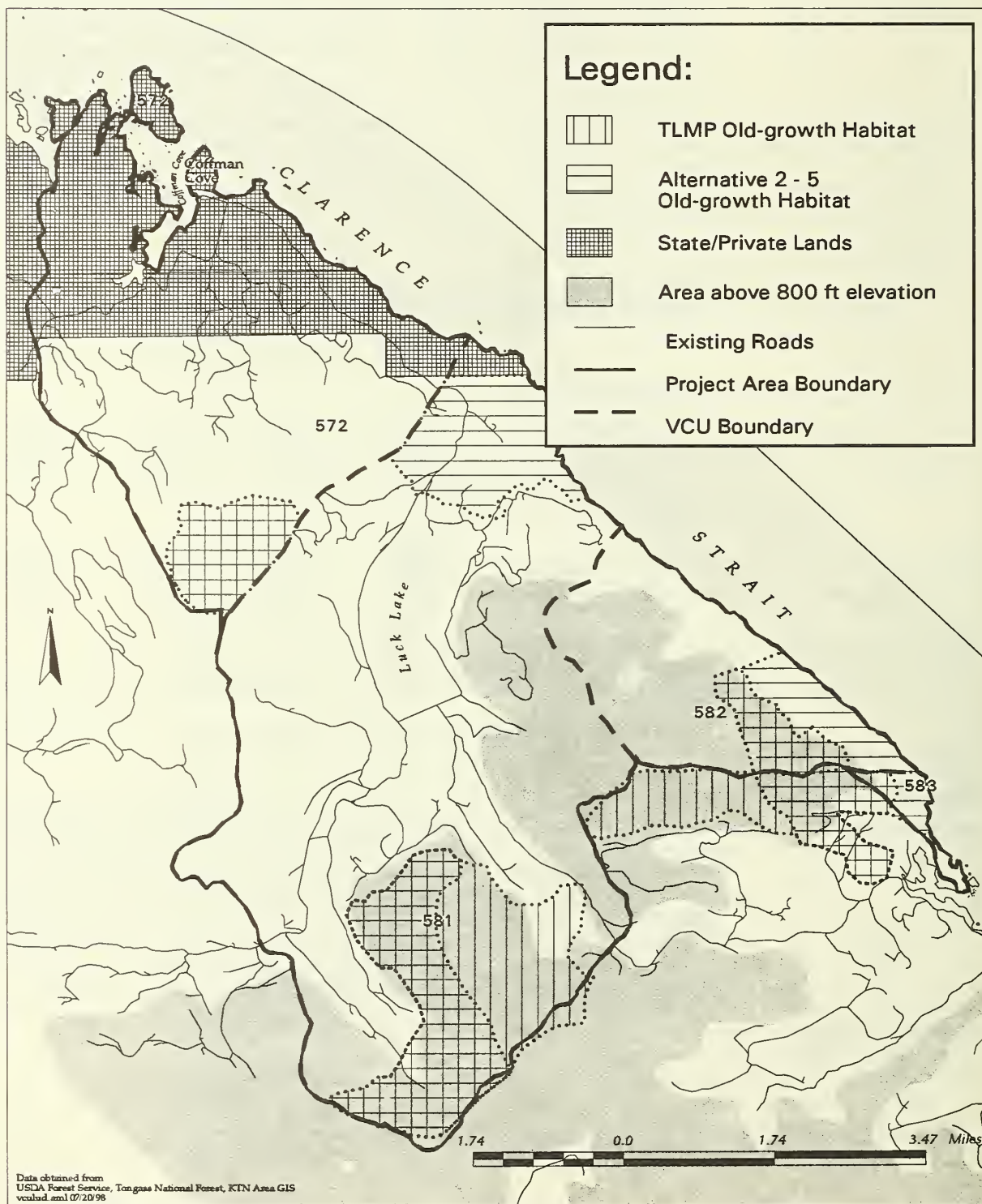
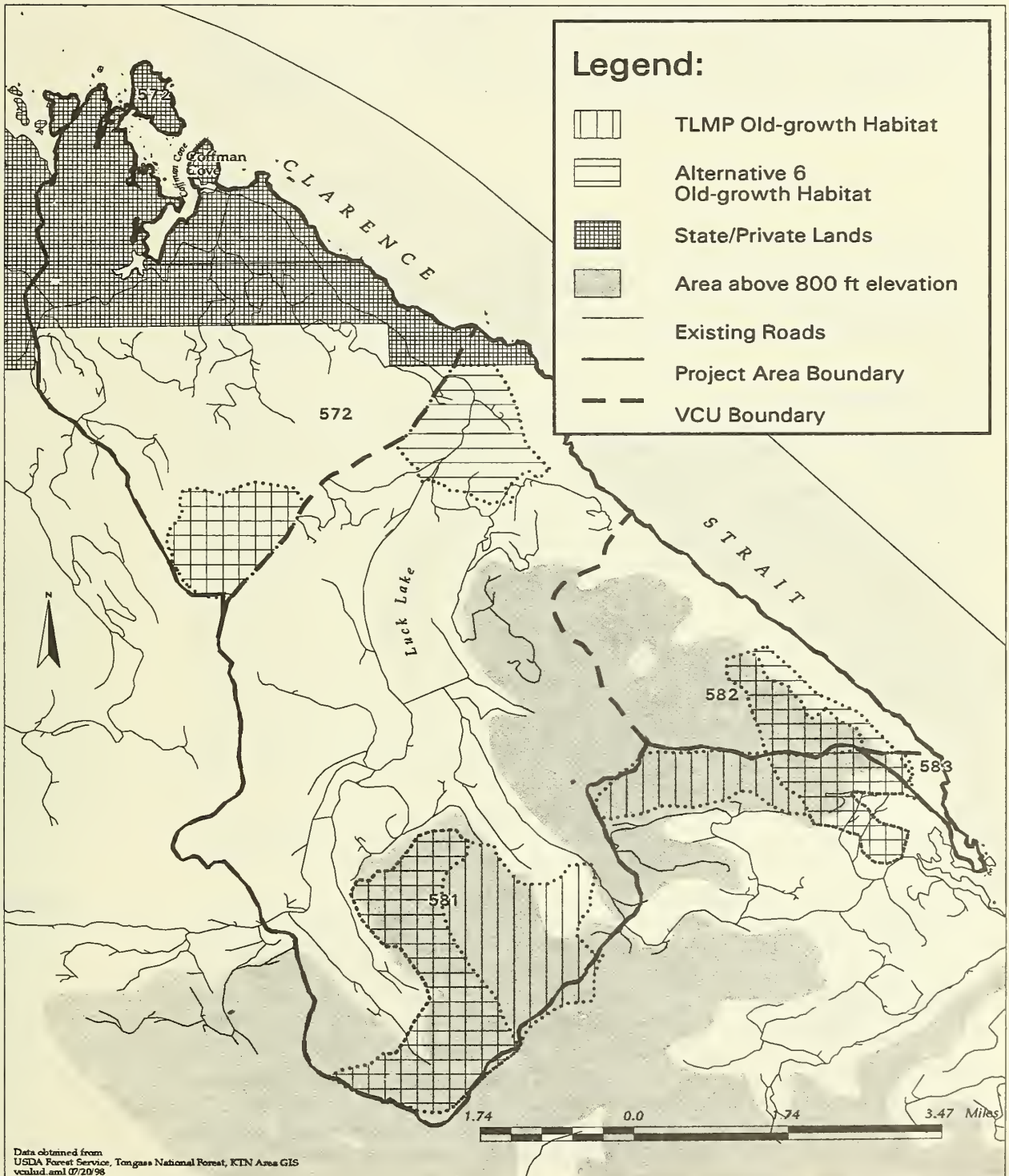


Figure OG-2
Luck Lake Project Area Old-growth Habitat Reserves, Alternative 6



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Fisheries Resources

The following descriptions and analyses are summarized from the Fisheries Resource Report (1998) and the Watershed Analysis for the Luck Lake Project Area (1998). A related analysis of fisheries is contained in the Forest Plan FEIS, Chapter 3. Applicable fisheries and riparian direction is contained in the Forest Plan, Chapter 4 (Forest-wide standards and guidelines), and Appendices D and J. The unit and road cards (Appendices B and C for this document) for the Luck Lake Project contain additional site specific implementation requirements.

Affected Environment

Fish Species and Uses

Project Area streams contain important anadromous and resident fish habitats. The streams support four species of anadromous salmon (pink, chum, sockeye, and coho), as well as resident coastal cutthroat trout, rainbow/steelhead trout, and Dolly Varden char. Chinook salmon are present in the inlets and bays of the Project Area, but do not spawn in its streams. These fish species are important to the subsistence, sport and commercial fisheries of the region, and are a major food source for many wildlife species.

Subsistence use of fish species within the Luck Lake Project Area is low compared to nearby Prince of Wales Island streams such as Hatchery Creek. Conversely, sportfish use is relatively high within the Luck Creek/Luck Lake/Eagle Creek stream system. The target species are primarily steelhead, coastal cutthroat trout, and Dolly Varden char. Streams within the area also contribute to the commercial fisheries of the Southeast Alaska. The Luck Creek/Luck Lake/Eagle Creek stream system has the highest escapement (fish moving from salt to fresh water) of pink, chum, sockeye, and coho salmon within the Project Area. Chum Creek and Coffman Creeks are also important in providing pink salmon and minor amounts of chum and coho salmon to the commercial fishery.

Eagle Creek is a constant "hotspot" for poaching and sportfish regulations violations. Steelhead is the species most affected. Most of the violations involve keeping undersize steelhead and using bait. Steelhead populations in Southeast Alaska have generally declined over the last decade prompting the Alaska Department of Fish and Game (ADF&G) to require catch-and-release regulations on steelhead less than 36 inches in total length. Due to the general decline in conjunction with the sportfish violations, ADF&G is considering closing the stream to sportfishing during the time steelhead are returning.

Sockeye salmon from the Luck Lake drainage have been noted as being somewhat "unique" among the sockeye salmon stocks of Southeast Alaska. A reverse sexual size dimorphism has been found in this stock, with females generally longer in length than males.

Fish Habitat

Fish habitat can be described by watershed, stream class, and process group (stream channel typing). Process groups are discussed in the Water section of this chapter. Watersheds are areas that collect and discharge runoff through a given point on a stream. The Luck Lake Project Area includes 18 separate watersheds (with the Luck Creek/Luck Lake/Eagle Creek system considered one watershed), but over half of the area is located in three watersheds, Coffman Creek, Chum Creek, and the combined Luck Creek/Luck Lake/Eagle Creek stream systems. These three watersheds contain about 75 percent of the area's fish habitat.

A detailed watershed analysis is contained in the planning record (Watershed Analysis for the Luck Lake Project Area, 1998). A sediment risk model was run on all the watersheds. This model indicates that the watersheds with the highest risk of adverse effects from upstream sediment are the Luck Creek/Luck Lake/Eagle Creek watershed and Coffman Creek

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watershed. The lower reach of Luck Creek, near where the stream enters Luck Lake, is considered a high-density fish habitat area. Spawning habitat has been identified for both coho and sockeye salmon, and may also exist for steelhead.

There are approximately 181 miles of streams in the Project Area. Of these, 48 miles are classified as Class I streams (streams providing anadromous and adfluvial fish habitat), and 25 1/2 miles are Class II (providing resident fish habitat). The remaining streams do not provide fish habitat, but can affect fish streams: Class III streams (96 miles) are those having an immediate influence on downstream fish habitat, and Class IV streams (12 miles) account for the rest.

Concern over fish habitat in the "Luck Lake drainage" (the Luck Creek/Luck Lake/Eagle Creek watershed) is an aspect of one of the project issues. This watershed alone contains about 33 miles of Class I streams, 69 percent of the Class I streams in the Project Area, and over 7 miles of Class II streams. The Luck Lake drainage is further discussed in the Water section of this chapter.

There are 620 acres of lake habitat in the Luck Lake Project Area, with Luck Lake itself comprising 531 acres.

Existing Harvested Areas and Road Crossings

Timber harvest and roads are typically the forest management activities with the highest potential to adversely affect fisheries habitats. The Luck Lake Project Area has been extensively harvested, with approximately 9,900 acres clearcut between 1955 and 1997. Prior to 1990 trees were harvested down to the streambank of fish-bearing streams in several locations. Of the 6,857 acres of riparian area within the Project Area, 2,248 acres have been harvested. Of the area's 181 miles of streams, harvest has occurred on 49 1/2 miles, including about 16 miles of Class I streams and 10 miles of Class II streams. Within the Luck Lake drainage, riparian harvest has occurred on 34 miles of streams, which is 68 percent of the total past riparian timber harvest in the Project Area.

The Luck Lake Project Area has also been extensively roaded. The area currently has 89 miles of road, 63 of these open to motorized use. There are 159 existing stream crossings, 72 of which cross Class I or Class II streams.

Environmental Consequences

Timber harvest activities have the potential to affect fisheries resources by altering fish habitat. Logging and associated road building can affect fisheries resources by changing the delivery of water, sediment, and input of large woody debris into the stream system. Changes of the input and transport of these components can adversely affect the capability of the stream habitat to produce fish. The closer the timber harvest activities are to a stream, the higher the risk of adversely affecting fish habitat.

Fish Habitat Protection Standards (Mitigation)

The National Forest Management Act implementing regulations prohibit any activities near streams which would seriously and adversely affect fish habitat (36 CFR 219.27 (e)). In addition, the Tongass Timber Reform Act of 1990 requires a no-harvest buffer zone of at least 100 feet on each side of all Class I streams, and all Class II streams that flow directly into Class I streams (section 103 (a)).

The Forest Plan Riparian standards and guidelines incorporate this direction and provide additional protections. The Riparian standards and guidelines require no-harvest buffers along all Class I, II, and III streams, based on stream process groups and a defined Riparian Management Area, and provide guidelines for management beyond the no-harvest zone to provide for a reasonable assurance of windfirmness. Finally, the Best Management Practices (BMP's), designed to ensure compliance with the Clean Water Act, help protect riparian

habitat on streams or portions of streams not protected by buffer zones. In order to minimize the potential for adverse impacts on soil and water resources by management activities, BMP's are used to directly or indirectly protect water quality from non-point source pollution. This is typically done through site-specific prescriptions.

The results of the watershed analysis mentioned previously were used in the design of harvest units and the inclusion of additional mitigation measures. Areas where high risk was indicated were avoided. No modifications to Class III buffers were made as a result of this analysis. If additional streams are found during project layout, the same standards and guidelines will be applied. Future monitoring will focus on the effectiveness and adequacy of buffer prescriptions.

Forest Plan standards and guidelines, BMP's, and project designed mitigation included in road and unit cards have been used to avoid or minimize adverse effects to the Project Area fisheries resource. Measurable direct, indirect, or cumulative effects to fisheries resources are not anticipated.

The following discussions address the potential risk that unforeseen effects may still occur. It should be emphasized that this is only an indication of relative risk; we do not anticipate any significant adverse effects to occur.

Roads and Stream Crossings

Road construction and use often pose the greatest potential risk to riparian resources and fish habitat capabilities. Road construction, under all action alternatives, requires crossing streams to access timber harvest units. Roads can affect fish habitat through the introduction of fine sediment, increased landslide potential due to road location and design, and re-routing of sediment-laden water. Road construction also has the potential to affect upstream fish passage through improper placement or sizing of culverts.

The total number of stream crossings required by alternative are: Alternative 1 - 0; Alternative 2 - 6; Alternative 3 - 2; Alternative 4 - 13; Alternative 5 - 5; and Alternative 6 - 13. No alternative adds new crossings to Class I streams, and only Alternatives 4 and 6 add crossings (one) to Class II streams. Therefore, only Alternatives 4 and 6 add a new crossing to a fish-bearing stream. Alternatives 4 and 6 also have the most new road construction, 15.3 miles, which is more than twice that of any other alternative. Alternative 5 builds 6.7 miles of new roads, Alternative 3 builds 6.4 miles, and Alternative 2 builds 5.6 miles.

Timber Harvest

Removal of riparian vegetation through timber harvest can affect fish habitat and fish populations by increasing sediment inputs into streams, changing stream temperature and dissolved oxygen levels, changing the input of large woody debris, and altering the delivery of water to streams. There will be no riparian area harvest along any Class I, II, or III stream under any alternative. There is the possibility of loss of trees within riparian areas due to future windthrow; however, significant adverse effects to fish habitats or populations are not anticipated. Windthrow is discussed further in the Water section of this chapter.

Timber harvest may remove riparian vegetation to the streambank along Class IV streams included in harvest units. These are all non-fish-bearing streams, and water flows are typically intermittent or ephemeral. While these streams have insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality and fish habitat, they inevitably do introduce some sediment to streams. BMP's are applied to these streams, and they may also receive additional protection in the form of full suspension over the stream, directional felling, or split yarding, based on the physical characteristics of the stream and the need to protect streambank integrity. The miles of unbuffered Class IV

Effects of Alternatives

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streams by alternative are: Alternative 2 - 1.1 mile; Alternative 3 - 3.6 miles; Alternative 4 - 4 miles; Alternative 5 - 1.3 miles; and Alternative 6 - 4 miles.

Karst Resources and Geology

The following discussions and analysis are based on and summarized from the Geology, Minerals and Karst Resources Report for the Luck Lake Project Area (1998). Karst resources are also analyzed in the Forest Plan FEIS, Chapter 3. Direction for the management of karst resources is included in the Forest Plan, Chapter 3 (Management Prescriptions), Chapter 4 (Forest-wide Standards and Guidelines), and Appendix I.

Affected Environment

Geomorphology and Geology

The Luck Lake Project Area lies within the Baird Peak Geomorphic Area, which lies between the Thorne River/Hatchery Creek drainages to the west and Clarence Strait to the east. The topography and landforms are characterized by broad ridges trending northwest-southeast from Baird Peak, the highest feature of the geomorphic area at 3,064 feet above sea level, and small U-shaped valleys. Soils are dominantly well drained and productive on the valley side slopes and in the valley bottoms supporting hemlock/spruce forests. The broad ridgetops are covered with organic soils supporting bog vegetation.

The Project Area is predominately underlain by Silurian and Ordovician age sedimentary and volcanic rocks of the Alexander Terrain. The sedimentary and volcanic rocks found here seem to be slightly metamorphosed and are intruded by Cretaceous granodiorite along the southeastern project boundary. The dominant rock types are andesites, basalts, and granodiorites in the higher elevations and southern portions of the area, and grawacke, siltstone, mudstone, sedimentary breccia, and limestone in the northern lower elevations (Brew, 1996). Marble is found on the northwestern flanks of Baird Peak. This marble is thin bedded, blue and white banded, and steeply dipping. Karst landforms and drainage systems has developed within the marble outcrops. Rock units have been offset by major northwest-southeast trending faults, moving the blocks to their present location where they have been subsequently glaciated, weathered, and eroded.

Karst Resources

Karst is a comprehensive term that applies to the unique topography, surface and subsurface drainage systems, and landforms that develop by the action of water on soluble rock; in the case of Southeast Alaska, limestone and marble. The dissolution of the rock results in the development of internal drainage, producing sinking streams, closed depressions, and other solutional landforms such as sinkholes, collapse channels and caves (White et al. 1995).

The geology and climate of Southeast Alaska are particularly favorable for karst development. Extensive areas of very pure carbonate, approximately 515,000 thousand acres, are found within the boundaries of the Tongass National Forest. Because of the highly fractured nature of the carbonates, high annual precipitation, and the peatlands proximal to the carbonate bedrock, karst has developed, to one extent or another, within all carbonate blocks. The Tongass contains the largest concentration of dissolution caves known in Alaska.

Karst resources are well developed within the carbonates of the Project Area. Drainages disappear along the margins of the faulted marble blocks, and sinkholes and other collapse features are numerous across the surface of the karst plateaus. There are 382 acres of karst land in the Project Area; timber harvesting has occurred on 196 of these acres.

Karst Management

Karst lands impose land management challenges not encountered in non-karst areas because the three-dimensional landform of karst lands functions differently than other landforms. Recognizing these differences, the Tongass National Forest has incorporated karst

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management standards and guidelines into the Forest Plan (pp. 4-18 to 4-20, and Appendix I). These provide for other land uses while taking into account the function and biological significance of the karst and cave resources within the landscape.

The Karst and Caves forest-wide standards and guidelines categorize karst areas as to their vulnerability for being adversely affected by management activities. Vulnerability mapping utilizes the fact that some parts of a karst landscape are more sensitive than others to planned land uses. The differences in vulnerability or sensitivity of a particular system are typically a function of the extent of karst development, the openness of the karst system, and the sensitivity of other resources that benefit from the karst ground water systems. High vulnerability karst land is considered unsuitable for timber management and is removed from the suitable land base. Moderate vulnerability lands are available for timber harvest, with some limitations on harvest systems and methods (see Mitigation discussion at end of this section). Low vulnerability karst lands have no karst-specific management restrictions.

The karst lands of the Project Area tend to be of moderate vulnerability with inclusions of high vulnerability. The highly vulnerable areas are both discrete karst features and areas of intense epikarst (surface) development. Though karst topography and subsurface drainage systems are well developed in the carbonate substrate, few caves have been found, and these tend to be shallow, short tubes within the epikarst zone. Proposed harvest Unit 581-444 and the northern half of Unit 581-423 are adjacent to areas which contain some of these shallow cave features.

Environmental Consequences

Effects on Karst Resources

Any surface management activity on a karst landscape is likely to affect the components of that landscape to some extent. Surface landforms and surface water hydrology would most obviously be affected; however, the direct link between surface water and subsurface drainage implies that karst hydrologic systems and cave ecosystems could also be affected. A more detailed overview of potential effects to karst resources is contained in the Forest Plan FEIS (Chapter 3, pp. 3-82 to 3-86).

Under the Forest Plan standards and guidelines, no harvest will occur on high vulnerability karst lands. From the original unit pool for the Luck Lake Project Area, several units were dropped and others modified to protect high vulnerability karst areas. The remaining acres of karst on which timber harvest is proposed can be characterized as moderate vulnerability karst lands which contain few discrete karst features of high vulnerability. It can be expected that 10 to 20 percent of the acres of harvest units proposed on karst lands (Table K-1) will be removed from timber harvest availability to protect discrete karst features. This will occur during project layout.

There is little chance of sediment or organic material entering the karst hydrologic systems of the Project Area. The epikarst is moderate- to well-developed and is visible at the surface. The soils are a mosaic of shallow organic soils and mineral soils and glacial till. The mineral and glacial soils infill the epikarst channels. Since the epikarst is not open to the conduits at depth, there should be little opportunity to move sediment and debris vertically into the karst hydrologic systems beneath. Partial suspension logging systems are required on karst lands to minimize soil disturbance.

Table K-1 displays by action alternative the acres of proposed harvest on karst lands. As noted earlier, 196 of the 382 acres (51 percent) of the karst in the Project Area have already been harvested. Alternatives 2, 3, 4, and 6 each propose harvest on 45 to 47 acres of karst, and Alternative 5 on 18 acres. These areas are all moderate vulnerability karst areas (if high vulnerability inclusions are discovered, they will be excluded from the harvested areas).

Partial suspension logging systems and other specific measures will be required (see Mitigation), and no adverse effects to karst ecosystems are anticipated. Cumulatively, the percentage of total karst in a harvested condition from past and proposed timber management would be 63 to 64 percent under Alternatives 2, 3, 4, and 6, and 56 percent under Alternative 5.

Table K-1 also displays by action alternative the miles of new road construction atop karst needed to access harvest units. This ranges from about one-third mile in Alternative 5 to just under one mile in Alternatives 4 and 6. As previously mentioned, none of the harvest is on high vulnerability karst and no proposed roads cross high vulnerability karstlands.

Table K-1
Effects of the Alternatives on Karst Lands

	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Acres of Harvest on Karst	45	45	47	18	47
Cumulative Percent of Project Area Karst Harvested*	63%	63%	64%	56%	64%
Miles of New Road on Karst	0.54	0.48	0.90	0.32	0.90
Cumulative Miles of Road on Karst*	2.69	2.63	3.05	2.47	3.05

*From this and previous project activities.

Mitigation

High vulnerability karst is removed from the suitable timber base; low vulnerability karst does not require specific practices other than what are normally applied (see Soil and Water sections of this chapter). Summarized here are mitigations to be applied to moderate vulnerability karst. See the Forest Plan (pp. 4-18 to 4-20, and Appendix I) for the full set of karst standards and guidelines to be applied. These are also specified on the unit and road cards (Appendices B and C); the need for some requirements will be determined during project layout.

To protect the fragile soils, at a minimum the yarding system selected will be required to achieve partial suspension. Longer timber harvest rotational periods may be appropriate. Existing roads and quarries will be used if possible in preference to the construction of new ones. Roads shall avoid sinkholes and other collapse features. At no time shall roads divert water to or from karst features. Measures shall be taken to reduce erosion and sediment transport from the road surface and cutslopes. Additional design criteria may be required relating to road construction methods, blasting, culvert placement and density, and sediment retention and erosion prevention. No quarry shall be developed atop karst without adequate site survey and design.

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Recreation

The following discussions and analysis are based on the Scenic Quality and Recreation Effects Analysis Report for the Luck Lake Project Area (1998). The Tongass' recreation and roadless area resources are discussed in considerable detail in the Forest Plan FEIS, Chapter 3. Applicable direction from the Forest Plan is contained in Chapters (Modified Landscape Land Use Designation) and Chapter 4 (Forest-wide Standards and Guidelines). See also the Scenery section of this chapter.

Affected Environment

Most recreation occurring in the Project Area is land based and accessible by road or trail. The only saltwater-based access point (other than through the community of Coffman Cove) is just south of the Project Area at Big Ratz Harbor. One developed recreation site at Luck Lake is maintained at the present time for day use activities and fresh water recreation opportunities. Most recreation use within the Project Area is restricted to Luck Lake and Eagle Creek and is in the form of fishing, swimming, and boating. Upland recreation is mainly hunting and hiking in the alpine areas west of Luck Lake and also on Baird Peak.

Recreation Places

Recreation places are areas where recreation is occurring or has the likely potential to occur. These can include trails, picnic areas, shelter sites, trailheads, roadless areas, and anchorages. The Project Area currently has three identified recreation places: the Luck Lake picnic area, Eagle Creek trail and trailhead, and the Ratz roadless area. The Big Ratz Harbor anchorage lies just south of the Project Area; no project activities are proposed in that portion of the area. Two potential recreation sites are a trail, trailhead, and shelter at Baird Peak, and a Canyon Spur trail, trailhead, and shelter near Eagle Creek.

Eagle Creek Trail and Trailhead

The trail and the trailhead are presently in an unmodified condition and are not directly affected by past timber harvesting. Views along some portions of the trail are modified. The bank of Eagle Creek opposite the trail was harvested in the past, but regrowth now covers most evidence of past harvest.

Luck Lake Picnic Area

The setting of the road entering this recreation site has been heavily modified by timber harvest. Most of the timber has been removed from the site itself, with the exception of a small fringe of trees along the shore of Luck Lake. Regrowth is significant enough to cover most evidence of past harvest.

Baird Peak Trail, Trailhead, and Shelter

The trailhead lies within a 15-year-old timber harvest unit adjacent to a logging road. The proposed trail would traverse thin strips of old-growth forest and alpine to the lakes at the base of Baird Peak. Proposed shelter sites lie within an unmodified environment on the shore of these lakes.

Canyon Spur Trail, Trailhead, and Shelter

This future shelter location is accessed from a trailhead on Canyon Spur (near Eagle Creek). The trailhead and the first 500 feet of trail would be affected by the sites and sounds of timber harvest. The rest of the trail and the shelter location would be in a more natural setting.

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Ratz Inventoried Roadless Area

The Ratz roadless area (number 512) is located in the southeast portion of the Project Area, between the Luck Lake watershed and Big Ratz Harbor. The area is characterized by very rugged terrain except for the uplands west of Ratz Harbor where the topography is flat wetlands and muskeg. The area is 5,184 acres in size and is bounded by roads and timber harvest units on three sides, and saltwater to the east. The major scenic features are the diverse alpine terrain and small lakes near the summit of Baird Peak. The area is used lightly by local people for recreation and subsistence. The Ratz roadless area has been unaltered by human activity, but due to the extensive timber harvest around the periphery the natural integrity is only fair. Except when active logging occurs, opportunities for solitude are good.

Environmental Consequences

Effects on Recreation Places

Eagle Creek Trail and Trailhead

Short-term recreation effects will occur in the form of sounds of logging activities. Some minor visual disturbances may be seen from the beginning of the trail. There will be no site-specific, direct effects on the trail corridor under any alternative.

Luck Lake Picnic Area

Short-term recreation effects will occur in the form of sounds of logging activities. Some minor visual disturbances may be seen from the beach and parking area. There will be no site-specific, direct effects on the picnic area under any alternative.

Baird Peak Trail, Trailhead, and Shelter

Since the actual alignment for the proposed trail and the sites for the proposed shelters have not been determined, it is likely that most potential effects can be mitigated by site location. Timber harvest will occur in the vicinity of the proposed locations, and the sounds of harvest activities will be noticeable in the short-term. Longer-term effects in the form of alteration of the visible landscape may be present.

Canyon Spur Trail, Trailhead, and Shelter

Since the actual alignment for the proposed trail and the sites for the proposed shelters have not been determined, it is likely that most potential effects can be mitigated by site location. Timber harvest will occur in the vicinity of the proposed locations, and the sounds of harvest activities will be noticeable in the short-term. Longer-term effects in the form of alteration of the visible landscape may be present.

Ratz Inventoried Roadless Area

The alternatives will affect the Ratz roadless area variously. The status of "inventoried roadless area" is usually limited to unroaded areas at least 5,000 acres in size (other than entire islands). (Inventoried roadless areas are those meeting minimum requirements for possible future consideration as Wilderness.) At 5,184 acres, the Ratz area will go below the minimum size requirement with relatively small alterations to its natural character.

Of the five action alternatives, three are not likely to change the roadless area status of the Ratz area. Alternative 5 has no activities proposed in the Ratz area. Alternative 3 has several small harvest units along existing roads on the west side of the area; these would not cumulatively result in the roadless character dropping below 5,000 acres. Alternative 2 has three small units and a spur road of about one mile entering the area to the north of Baird Peak; these alterations would leave the roadless portion at about 5,000 acres.

Alternatives 4 and 6, however, enter the Ratz roadless area with several miles of road and a number of harvest units of varying size. These alternatives would substantially alter the northern portion of the area (essentially the entire portion north of Baird Peak) and reduce its

remaining unaltered portion to well under 5,000 acres. The Ratz area could no longer be considered an inventoried roadless area.

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Scenery

The following discussions and analysis are based on and summarized from the Scenic Quality and Recreation Effects Analysis Report for the Luck Lake Project Area (1998). The scenic resources of the Tongass are also discussed in the Forest Plan FEIS, Chapter 3. Applicable direction may be found in the Forest Plan, Chapter 3 (Modified Landscape Land Use Designation), Chapter 4 (Forest-wide Standards and Guidelines), and Appendix F.

Affected Environment

Visual Character of the Project Area

The scenery of the Luck Lake Project Area varies from low rolling hills at Coffman Cove to the prominence of Baird Peak and its surrounding ridgelines just north of Ratz Harbor. In general the Project Area is typified by mountains up to 3,000 feet in elevation with one major east to west oriented stream and lake system. The mountains have extensive alpine areas with little or no vegetation and steep, densely forested hillsides. The stream and lake system consists of Luck Creek, which is four miles long and flows from the south into Luck Lake. Luck Lake is two miles long and one-half mile wide and is drained by Eagle Creek, which flows north one mile into Clarence Strait. The alpine areas are dominated by scenic Baird Peak and nearby Baird Lake, situated at nearly 2,000 feet in elevation and surrounded by subalpine vegetation.

For planning and analysis, the scenic resource is described by viewsheds. A viewshed is the area visible from a specific human use area or travel route. The Forest Plan identifies specific "priority" use areas and travel routes for which the scenic resource is emphasized. The Luck Lake Project Area has four priority use areas:

- Coffman Cove
- Luck Lake and Luck Lake Boat Launch
- Eagle Creek Trail
- Alaska Marine Highway Ferry Route

The area's two major roads (forest development roads, or FDR's) are FDR 30 and FDR 3030. Together, these connect the communities of Coffman Cove and Thorne Bay. These routes are considered non-priority use areas.

The visual condition of the Project Area varies by location and is dependent on a variety of factors. In addition to the natural aspects just described, timber harvesting and road construction have altered the visual character of portions of the Project Area. Approximately 73 percent of the area is in an unaltered and naturally appearing condition (including all alpine areas and waterbodies). About 19 percent of the area is in a slightly altered condition, consisting of units harvested between 1947 to 1977. Another eight percent is considered moderately to heavily altered.

The Forest Plan provides specific visual management direction for the National Forest lands within the Project Area. The Timber Production and Modified Landscape Land Use Designations include visual resource standards and guidelines that apply to the timber harvest and related activities they allow. Generally, and exclusive of the Old-growth Habitat Land Use Designation, Timber Production encompasses areas not seen from the Alaska Marine Highway Ferry route, and Modified Landscape applies to the ferry route and Luck Lake viewsheds. The Modified Landscape designation allows foreground areas to be slightly altered (8-20 percent visible disturbance), and middle-ground and foreground areas to be

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Visual Condition of the Viewsheds

moderately altered (15-25 percent visible disturbance). Timber Production allows foreground areas to be moderately altered, and all other areas to be heavily altered (50 percent visible disturbance).

All of the viewsheds identified above are in a moderately to heavily altered condition. This is a result of past harvest being conducted at lower elevations and within popular use areas.

Priority Use Area Viewsheds

Coffman Cove: Moderately Altered - 30% Visible Disturbance

The hillsides behind Coffman Cove have seen quite a bit of harvest activity and alteration over the last thirty years. Harvest units and road systems implemented in the last five years are readily noticeable from points around town. Recent harvest on adjacent State of Alaska lands is highly noticeable from the harbor and its approaches from Clarence Strait and Kashevarof Pass. Almost all of the visible harvest on National Forest land falls within the Timber Production Land Use Designation.

Luck Lake and Luck Lake Boat Launch: Heavily Altered - 39% Visible Disturbance

From the surface of Luck Lake and the boat launch area, a significant amount of harvest is noticeable. The area appears to be highly and actively modified. Several clearcut harvest units less than three years old are visible from the day use site; these units and more are easily seen from the surface of the lake and the boat launch, depending upon the viewer's location. Very little old-growth forest remains within the foreground and middle-ground distances of this viewshed, although much of what has been harvested is now reaching the age that it covers the bare, harvested ground and presents an even, green appearance. Some roads and landings are still visible and will continue to be through the duration of this project.

This viewshed exceeds the guidelines for allowable harvest under the Forest Plan prescription for Modified Landscape as it does not have visual characteristics similar to those naturally occurring in the surrounding unmodified landscape.

Eagle Creek Trail: Heavily Altered - 39% Visible Disturbance

The interior viewshed of Eagle Creek Trail is unaltered with the exception of a few views upstream near the outlet of Luck Lake. These views are confined to the area approximately 50 yards downstream of the bridge and from the bridge upstream to the outlet of Luck Lake. These views are focused on the hillsides below Baird Peak and on the west and south side of Luck Lake. Although only occasional glimpses of recent harvest are available, almost all the hillsides that are visible have been harvested in the past and are in various stages of regrowth.

This viewshed exceeds the guidelines for allowable harvest under the Forest Plan prescription for Modified Landscape as it does not have visual characteristics similar to those naturally occurring in the surrounding unmodified landscape.

Alaska Marine Highway Ferry Route: Moderately Altered - 21% Visible Disturbance

The views seen from the decks and cabins of Alaska Marine Highway ferries encompass a large majority of the Project Area. These views are usually of long duration and are studied in detail by ferry passengers and those on other craft plying Clarence Strait and Kashevarof Pass. The scenery along the route has been moderately to heavily altered throughout the Project Area. All stages of harvest and regrowth are visible - from the unmodified shoreline and forested hillsides north of Ratz Harbor to recent clearcuts adjacent to Eagle Creek to the various stages of regrowth above FDR 3030 southeast of Coffman Cove. Many roads and some rockpits are also visible along this route. New harvest occurring on State of Alaska lands is within the background views as seen from the decks of the ferry. The visual impact of this clearcut harvest may push this viewshed over the threshold of allowable visual disturbance.

Non-priority Use Area Viewsheds

Although not priority travel routes, FDR 30 and FDR 3030 together are the major travel route between Coffman Cove and Thorne Bay. The viewshed of the portion of FDR 30 within the Project Area has been heavily modified by timber harvest activities in all distance zones. At several places along the road there are background views of the mountain range west of Luck Lake, which has been heavily and almost entirely harvested over the last ten years. FDR 3030 connects with FDR 30 at the south end of Luck Lake and continues northward to Coffman Cove and then southwest out of Coffman Cove. This route includes heavily modified foreground views along the shores of Luck Lake and Clarence Strait, and modified middle and background views across the lake to the slopes below Baird Peak. Recent harvest of most of the State of Alaska land west of the road is a major foreground impact from the Coffman Cove town limits for approximately three miles.

The portions of these viewsheds within the Modified Landscape designation exceed the Forest Plan guidelines for allowable harvest; they do not have visual characteristics similar to those naturally occurring in the surrounding, unmodified landscape.

Environmental Consequences

Effects by Viewshed

The effects discussion centers on the viewsheds just described. All other areas are considered unseen. The discussions assume that all units receive partial cut harvest prescriptions and retain 30 percent crown cover (see descriptions of alternatives in Chapter 2), with the exception of one modified clearcut unit (582-402) in both Alternatives 4 and 6.

Priority Use Viewsheds

Coffman Cove

There will be little noticeable effect on the scenery resource in this viewshed as a result of timber harvest activity in any alternative. Selective harvest techniques will result in textural differences only. This viewshed will remain within Timber Production Land Use Designation visible disturbance thresholds.

Luck Lake and Luck Lake Boat Launch

This viewshed currently exceeds visible disturbance thresholds for Modified Landscape. However, timber harvest under the Luck Lake alternatives will not noticeably exacerbate this condition. Little visual change will result from the partial harvest of units visible from the lake, and the differences in units harvested by alternative are minor. Of five potential units in the viewshed, Alternatives 3, 4, and 6 harvest all five, and Alternatives 2 and 5 each harvest three. Mitigation will be necessary for road and rockpit development within this viewshed, as specified on the road cards (Appendix C).

Eagle Creek Trail

This viewshed currently exceeds visible disturbance thresholds for Modified Landscape. However, timber harvest under the Luck Lake alternatives will not noticeably exacerbate this condition. Little visual change will result from the partial harvest of units visible from the trail, and the differences in units harvested by alternative are minor. Of six potential units in the viewshed, Alternatives 3, 4, and 6 harvest all six, Alternative 5 harvests four, and Alternative 2 harvests three. Mitigation will be necessary for road and rockpit development within this viewshed, as specified on the road cards (Appendix C).

Alaska Marine Highway Ferry Route

Most of the Luck Lake units are seen from the decks of the ferry at some point along the route. Although the viewshed is currently within the visible disturbance threshold for

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Modified Landscape, recent timber harvest of State of Alaska lands south of Coffman Cove is impacting the viewshed heavily. Little change will result from the partial harvest of units visible from the ferry route, which will occur under all action alternatives. Alternatives 4 and 6 include one modified clearcut unit (clearcut with reserves) in VCU 582 which, if not carefully planned, could further degrade the scenic qualities of the ferry route viewshed. In combination with the harvesting on State lands, this could result in delaying future harvest entry.

Non-Priority Use Area Viewsheds

Many of the Luck Lake Project units will be visible from the roads connecting Thorne Bay and Coffman Cove. Almost all of these units will be in the middle-ground viewing distance, and noticeable by travellers only infrequently. Some of these units will exhibit textural differences for several years after harvest activities cease. One unit (572-412), included in Alternatives 3, 4, 5, and 6, lies within the foreground viewing distance of FDR 3030 and would be noticeable to passers-by.

Cumulative Effects

All priority use area viewsheds, and portions of the non-priority viewsheds, are within the Modified Landscape Land Use Designation of the Forest Plan. Over time the areas within this designation will change noticeably, from the current situation of obvious harvest effects and large tracts of even color and even texture old-growth forest with few natural openings, to a more visually diverse forest. Harvest visible to priority travel routes and use areas will be designed to reflect nearby landform shapes, and the visual impact of these openings will recede over time. Ultimately, the human-made openings will resemble natural occurrences, but at a larger scale than normally found in the natural environment.

For those portions of FDR 30 and FDR 3030 within the Timber Production Land Use Designation, the future will show more evidence of a working, industrial forest. Changes will be obvious to forest visitors in the form of harvest units and supporting infrastructure. Openings not visible from priority travel routes or use areas will be out of scale and will not resemble old-growth forest stands.

Mitigation

The important or more frequently seen viewsheds of the Project Area are identified as priority travel routes or use areas in the Forest Plan. All are managed under the Modified Landscape Land Use Designation, with effects to foreground views minimized. Portions of non-priority viewsheds are also within the Modified Landscape designation. Current and future units will primarily be harvested with partial harvest prescriptions which will further help to mitigate the visual effects of timber harvest.

Silviculture and Timber Management

The following discussions and analysis are based on the Silviculture and Timber Management Resource Report for the Luck Lake Project Area (1998). Additional background on forest land classification, silvicultural and logging systems, and other related topics may be found in the Forest Plan FEIS, Chapter 3: "Timber" and Appendix G. Applicable direction is contained in the Forest Plan, Chapter 2, Chapter 3 (Timber Production and Modified Landscape Land Use Designations), Chapter 4 (Forest-wide Standards and Guidelines), and Appendix A.

Affected Environment

Forest Land Classification

The natural vegetation of the Luck Lake Project Area is a mosaic of coniferous forest interspersed with alpine tundra, muskeg (bog), shrubland, estuarine, and beach fringe plant communities. The area contains seven forested plant series (climax communities), all of which are commonly found throughout Prince of Wales Island: Sitka spruce, western hemlock, and mountain hemlock series; western hemlock-yellowcedar and western hemlock-western redcedar series; and mixed conifer and shore pine series. Together these (and other forested climax communities in other areas) are loosely termed "old-growth forest." The Biodiversity and Old Growth section of this chapter discusses aspects of old-growth forest not related to forest products. Various nonforested plant communities also occur in the Project Area, in estuaries, riparian areas, muskegs, alpine meadows, and alpine lichen rock outcrops.

National Forest System lands are defined by vegetative cover, soil type, and administratively or congressionally designated land use. This classification scheme is intended to show the amount of land that is covered by forest vegetation with further divisions to show the amount of land capable of, or available for, timber production. Appendix A of the Forest Plan provides a detailed discussion of timber resource land suitability. To be considered both suitable and available for harvest, lands must be determined tentatively suitable for timber management, and must be within a land use designation that allows timber harvest. For the Project Area, these are the Timber Production and Modified Landscape Land Use Designations. Within these designations, Forest Plan standards and guidelines also apply, making additional areas - the beach and estuary fringe, areas of high vulnerability karst, riparian management areas, and wildlife nest or den buffers - unsuitable or unavailable for timber harvest.

To be considered suitable for timber management, forested lands must be capable of producing 20 cubic feet of tree growth annually, and/or must contain at least 8,000 board feet of net timber volume per acre. These are termed "commercial forest land." (In the Biodiversity and Old Growth, and Wildlife sections of this chapter, old-growth forest is divided into productive and nonproductive components. Productive old growth is synonymous with commercial forest land. In this section, the latter terminology will be used.)

Commercial forest land within the Project Area originally (in 1954) totaled about 24,478 acres, of which 9,938 acres have been harvested for timber to date. Of the remaining 14,540 acres of commercial forest land, 10,740 are classified as unsuitable for timber management, either through land use designation (as Old-growth Habitat), standards and guidelines (riparian areas and the beach fringe), or soils or slope criteria. This leaves 3,800 acres currently suitable and available for timber harvest.

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Forest Plan Desired Future Condition

The previously harvested areas are now young, second-growth stands. Some of these lands (2,840 acres) have since been transferred to non-Forest Service ownerships, and another 2,035 have since been reclassified as unsuitable for timber management. The remaining 5,063 acres of young growth stands (almost all younger than 40 years) will not be available for timber harvest until they reach about 80 to 100 years in age.

Stands of trees that are healthy and in a balanced mix of age classes, from very young to harvestable age, are a key part of the desired future condition for lands within the Timber Production Land Use Designation. Within the Modified Landscape designation, the desired condition is a variety of successional stages, with less evidence of harvest in foreground areas viewed by forest visitors (Forest Plan, Chapter 3, pages 3-135 and 3-144).

The typical development of an even-aged stand includes a seedling-sapling stage (the first 20 years following harvest), a pole-young sawtimber stage (20 to 80 years), and a mature sawtimber stage (80 to 100 years). Understory development occurs during the first and third stages, but is largely absent (except for mosses) during the pole-young sawtimber stage. If the stand is not harvested after 80-100 years, mature stand characteristics may last another 60 years or so, after which the stand will begin to develop a multi-storied and multi-aged structure more characteristic of old growth. Precommercial thinning can shorten the time for a stand to reach the pole-sawtimber stage and create a more two-storied stand structure as well as lengthening the time the productive understory remains for wildlife. Commercial thinning performed during the young sawtimber stage may add to stand structural diversity as well.

Although timber harvest activity has been somewhat continuous in the Project Area since about 1954, peaks of activity have occurred and the total number of acres harvested by decade is out of proportion compared to the percent of the rotation already passed. This is due in part to changes in land uses. Opportunities to achieve a more desired balance of age classes are not available for the existing young growth, and won't be until these young forests reach maturity or commercial size. Many past harvest areas are available for treatments which would contribute to the goals, objectives and desired future condition of the land use designation in which they occur. Precommercial tree thinning and other treatments which manipulate the vegetation can be of benefit not only to timber production but also to wildlife, fisheries, and scenic quality, and should be considered for these lands.

The current age class distribution for second-growth stands on National Forest lands within the Project Area is presented in the Current Age Class Distribution graph (Figure Silv-1). A small portion of this acreage, 225 acres, is included in the Old-growth Habitat Land Use Designation.

The 3,800 acres of suitable old-growth sawtimber in the Project Area could contribute to a more balanced mix of age classes if the harvest of remaining lands were evenly spread through the remainder of the timber harvest rotation (for about another 50 years). Assuming the remaining mature stands within the suitable and available acreage are scheduled for harvest over the next 50 years, an average of 76 acres could be harvested each year. It is not usually realistic to harvest in a Project Area each year, however, due to planning and timber sale time frames, timber harvest economics, and concerns for other resources. Therefore, an estimated harvest interval can be used to better fit planning and operational scheduling. Table Silv-1 displays, for different harvest intervals, how many acres of suitable and available timber lands could be harvested during an interval and contribute to a balance of age classes, assuming subsequent harvest at similar intervals.

Figure Silv-1
Luck Lake Project Area - Acres of Suitable Timber Harvested by Age Class

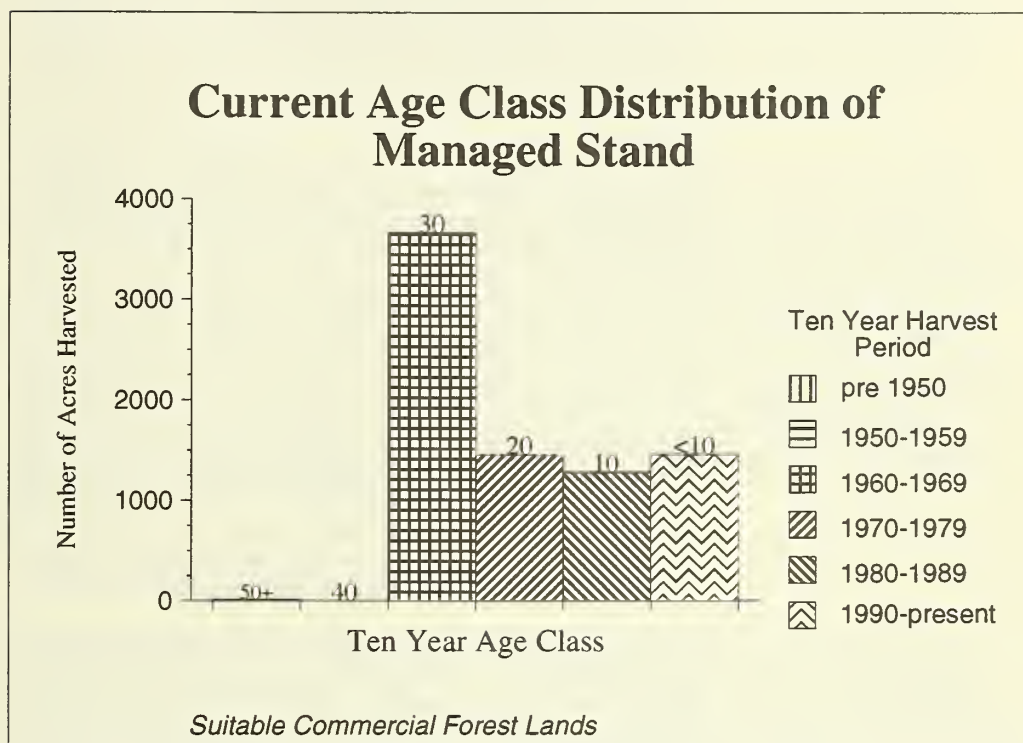


Table Silv-1
Acres of Harvest by Harvest Interval*

Harvest or Entry Interval (Years)	Acres Harvested Per Entry Interval
5	380
10	760
15	1,140
20	1,520

*3,800 acres harvested over the next 50 years.

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Silvicultural Systems

The term "silvicultural systems" refers to a planned process whereby a stand is harvested, re-established and tended. The system name is based on the number of age classes present after the initial harvest, such as even-aged, two-aged and uneven-aged systems.

Even-aged systems produce stands that consist of trees of the same or nearly the same age. A stand is considered even-aged if the range in tree ages normally does not exceed 20 percent of the age at which the stand is to be harvested (the "rotation age"). Seed tree cutting, shelterwood cutting, and clearcutting will produce even-aged stands.

Two-aged stands result from treatments which leave behind a substantial portion of the original stand structure in the form of large trees distributed or clumped throughout the stand area. The remnant trees left on the site represent one "age class" and the newly established trees represent another age class. Uneven-aged systems create stands that include three or more distinctly different age classes. Uneven-aged conditions are created through management by using individual tree or group selection methods.

Even-aged and two-aged systems more closely mimic the natural conditions of the disturbance ecologies (for instance, areas subject to windthrow) found throughout Southeast Alaska. Uneven-aged systems more closely mimic the gap dominated old-growth ecosystems (where large scale disturbance is not a major factor) found throughout Southeast Alaska.

The selection of the appropriate silvicultural system is dependent upon the feasibility of achieving sound silvicultural objectives. These can include objectives for species composition, stand density, growth rate, insect and disease control, and overstory condition and development. The Forest Plan and public issues are used to refine site-specific objectives. It is possible that more than one silvicultural system may be prescribed for the same site, depending upon the alternative in question.

It is important to distinguish scale when visualizing harvest treatments for individual units or stands. For instance, while the ideal condition may be to apply a treatment uniformly over an entire harvest unit, this is often not possible due to terrain, logging systems, or vegetative conditions. An objective may be to leave 50 percent of the existing trees undisturbed. However, conditions may prevent uniform distribution of retained vegetation resulting in groups of trees being left instead. This may result in what appears to be several small clearcuts, or even one larger clearcut, an extreme example. But when the entire treatment area is considered, half the trees have been retained, the prescription was followed, and resource objectives were met.

For a detailed discussion of silvicultural systems and methods, see the Forest Plan FEIS, Appendix G. Factors influencing and criteria for selection of appropriate harvest methods and silvicultural systems are also presented in the National Forest Management Act implementing regulations (36 CFR 219.27) and the Alaska Regional Guide.

Logging Systems

Yarding is the process of conveying logs from the stump to the landing. This can be done using ground-based equipment, cable logging systems, or helicopters. The method used depends upon many factors including access, topography, slope, and resource protection needs (log suspension requirements).

Ground Based Yarding

Moist, soft soil conditions in conjunction with steep slopes found in the Project Area prove difficult for ground-based equipment operation. Except for a limited amount of shovel logging with track mounted log loaders, there has been little opportunity for this type of equipment. Project Area logging systems planning classified units as either cable or helicopter yarded, but some portions of cable units, especially along road rights-of-way, may be suitable for shovel yarding. The decision to actually specify shovel yarding within a given unit is made at the time of unit layout.

Cable Yarding

Cable yarding systems are the most common logging systems used throughout the Ketchikan Area and for Prince of Wales Island. Cable systems are best suited for the steep slopes and wet soils of these areas, and most cable systems partially or fully suspend logs over the ground, minimizing soil disturbance. At the present time, running skyline has replaced highlead as the favored cable system when only partial suspension is required, and is more economical than other cable systems. Other cable systems are prescribed where running skyline does not meet yarding requirements, such as when resource conditions require increased log suspension, or yarding distances exceed running skyline capabilities.

Helicopter Yarding

Helicopter yarding is proposed in Alternatives 2, 3, 4, and 6. Helicopter yarding has been successfully used in all Administrative Areas of the Tongass in recent years. With this system, logs are lifted off the ground (fully suspended) and flown to a specially prepared landing. This yarding system causes the least amount of ground disturbance of all the yarding systems, but usually has the highest yarding cost. The economic feasibility of helicopter yarding is more closely affected by timber market values than is cable yarding. Currently helicopter flight time costs between \$2,000 and \$5,000 per hour, and a flight time between loads or turns of logs of no more than about three minutes is necessary for this system to be economical. Factors that affect flight time and economic feasibility include elevation differences between stump and landing, logs/volume per acre, species mix and subsequent value, and payload capabilities of the aircraft.

Environmental Consequences

Goals and objectives for various land use designations and the application of appropriate standards and guidelines found in the Forest Plan will result in the use of two-aged (partial cut) and uneven-aged silvicultural systems only. No clearcutting is prescribed for the Luck Lake Project under any of the alternatives, although one unit in both Alternatives 4 and 6 will be a "clearcut with reserves." Various forms of overstory removal, shelterwood with reserves, single tree selection and group selection may be used. Spatial distribution of retained trees will vary between harvest units and alternatives depending on resource objectives, site conditions and logging systems. Proposed harvest units range from 3 acres (Alternatives 4 and 6) to 89 acres (all action alternatives) in size. No units exceed 100 acres.

Silviculture: Direct, Indirect and Cumulative Effects

Regeneration

All of the areas proposed for timber harvest are expected to be restocked within five years, as required by National Forest Management Act regulations (36 CFR 219.27(c)). Regeneration (stocking) surveys will be conducted on all harvest units after the third full growing season following the completion of logging. All harvested areas under all alternatives are expected to be naturally stocked and certified after three full growing seasons. Should portions of harvest units require planting to meet minimum stocking requirements or other resource objectives, plans for planting will be made and a detailed, site-specific prescription will be prepared.

Required Retention

Forest Plan standards and guidelines require that a minimum of 30 percent canopy cover consisting of at least 8 large trees (20 inches DBH or greater) be retained in harvest units within VCU's 572 and 581 due to the amount of past harvest. An additional three large trees per acre are to be retained as snags or snag recruits (Forest Plan, p. 4-91). In VCU 582, a minimum of 10 percent canopy cover is to be retained in all new harvest units (Forest Plan, pp. 4-118 to 4-119). Several approaches will be used in site-specific prescriptions for harvest units to alleviate potential damage to the retained overstory from wind. Monitoring is

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planned to evaluate the success of various treatments using different spacial patterns of retained overstory trees.

Successional Stages and the Desired Future Condition

After reforestation, managed forests grow through several distinctive successional stages in which different components dominate the stand and forest structure changes over time. Harvest areas proposed under the Luck Lake Project are expected to have two or more age classes after the initial harvest. The stands will have characteristics of both old-growth and managed even-aged forests since a substantial portion of the original overstory will be retained in most harvest units under all alternatives. Harvest units within VCU 582 will be more similar to even-aged stands since the prescribed overstory retention levels are lower.

Land use designations allowing timber harvest activities within the Project Area are the Modified Landscape and Timber Production designations. Modified Landscape has a desired future condition of a variety of successional stages that provide a range of wildlife habitat conditions. Timber Production has a desired future condition of a balanced mix of age classes. All harvest alternatives will move the Project Area toward the desired future condition by creating young managed stands.

All harvest units consist of what are termed for silvicultural purposes "overmature" stands, and the acres of harvest in each alternative equates to the acres of overmature stands to be converted to a managed condition. Alternatives 4 and 6 convert the most acres to a managed condition (1,048 acres), followed by Alternative 3 (857 acres), Alternative 2 (464 acres), and Alternative 5 (431 acres). Alternative 1 proposes no timber harvest and thus converts no stands to a managed condition.

The number of acres harvested in Alternatives 2 and 5 equate to a harvest interval of about 6 years, in Alternative 3 an entry interval of about 12 years, and in Alternatives 4 and 6 about 15 years (refer to Table Silv-1). This interval is the time until the next harvest entry, assuming an even harvest spread out over the next 50 years. Simply put, as more acres are harvested in this entry, the length of time until the next entry increases if the Project Area's age class distribution for managed stands is to remain balanced.

Long-term Timber Productivity (Yield)

All stands proposed for harvest are overmature and well beyond the age of maximum average annual growth of the stand. Most are representative of uneven-aged western hemlock stands that commonly take hundreds of years to develop under natural conditions. Harvest increases forest floor temperatures, speeding up organic decomposition and increasing the supply of available nutrients to the trees. The effects of all action alternatives on long-term yield would be the partial conversion of unmanaged, slow-growing, overmature stands to managed, faster growing, multi-aged or two-aged stands.

The open conditions created by even-aged, two-aged and uneven-aged (group selection) systems allow Sitka spruce, western redcedar, Alaska yellowcedar and western hemlock to regenerate rapidly, but tend to favor spruce, the more desirable species for forest products, over hemlock. Based on past experience with even-aged stands, the composition generally includes 10 to 75 percent spruce, depending on the soil type and age of the stand; the volume of spruce in even-aged stands 75 to 100 years after harvest is about 50 percent compared to 28 percent in existing overmature stands. With the use of precommercial thinning, an additional 10-20 percent increase in the spruce component is attained. The composition of the two-aged and group selection uneven-aged stands proposed in the Luck Lake Project is expected to be similar to even-aged clearcuts.

Although log quality in managed stands could be lower than in existing overmature stands, even on sites that have been precommercially thinned, total yield per acre will be higher in managed stands. The lower quality would be reflected in the log grades, with managed

timber stands having fewer top grade logs than existing overmature stands. Most managed stands will exhibit less variation in tree diameter and height than the overmature stands they replace.

Post-harvest Silvicultural Treatments

Various post-harvest silvicultural treatments will be prescribed on a site-specific basis to help move the Project Area toward the Forest Plan desired future conditions. Treatments may vary from site to site depending on land use classification, slope, soils, aspect, elevation and resource objectives. Silvicultural treatments being considered for areas of prior harvest and harvest units proposed under the Luck Lake Project include precommercial thinning, commercial thinning, and pruning. The latter two, however, are not commonly used in the Tongass at the present time, and may not be implemented in the Luck Lake Project Area given current economic and/or technology limitations.

Precommercial thinning will occur in the Project Area on sites that have been previously harvested as well as on sites harvested under this project. Site-specific unit prescriptions will guide cultural treatments for units harvested under this project and on the ground investigations will identify areas of prior harvest in need of precommercial thinning. Precommercial thinning reduces the competition for sunlight, moisture, and nutrients for what is often referred to as growing space. This additional growing space results in the understory plants and remaining conifers growing at accelerated rates for longer time periods than unthinned, young even-aged stands. Precommercial thinning can also be used to change species composition and windfirmness of the stand. Cedar and spruce will be favored during the thinning process. Precommercial thinning may also be used to improve riparian conditions (where past logging was done close to streams) and increase forage for wildlife, should funding be available.

It should be recognized that precommercial thinning is performed approximately 15-25 years after harvest and is dependent upon site, stocking, and other resource needs. Due to steep terrain, accessibility, safety considerations, resource protection needs, and budget constraints, some acres will not be thinned.

Proposed harvest volume is displayed by VCU and alternative in Table Silv-2. Alternative 1 has no timber harvest. Alternatives 4 and 6 would offer the most timber volume for sale, almost 17 million board feet. It is the only alternative with harvest in VCU 582. Alternative 3 would offer just over 14 million board feet. Alternatives 2 and 5 offer the least volume, about 7.4 million, slightly more than half of Alternative 3. Harvest from VCU 581 is higher under all action alternatives than from VCU 572. Volume recovered from right-of-way clearing is considered incidental to the proposed timber harvest and is not included in the table. It varies from 150,000 board feet in Alternative 2 to 950,000 board feet in Alternative 4.

Timber Management: Direct, Indirect and Cumulative Effects

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Table Silv-2
Proposed Harvest Volumes by VCU by Alternative

VCU	Total MBF Volume					
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
572	0	1,022	3,248	4,137	1,862	4,137
581	0	6,426	10,905	11,070	5,549	11,070
582	0	0	0	1,727	0	1,727
Total Unit Volume*	0	7,448	14,153	16,934	7,411	16,934

Source: USDA-Forest Service, Ketchikan Area GIS

Logging System Transportation Analysis (LSTA)

The original LSTA for the Luck Lake Project Area identified approximately 1,800 acres of potential harvest units. From this pool of units, the interdisciplinary team selected 1,400 acres that, on paper, appeared to meet Forest Plan standards and guidelines and would therefore be suitable for timber management. However, the GIS data base is not refined enough to show small inclusions of unsuitable land within suitable stands. Subsequent field analysis removed another 350 acres (including portions of units) as being unsuitable for timber harvest, including areas not capable of producing sufficient volume or not harvestable using existing technology, and unmapped streams requiring riparian buffers. A list of the units not in the current Luck Lake unit pool and the reasons for not including them is contained in the project planning record.

Effects on Ketchikan Area Timber Supply

As part of the Forest Plan revision process, estimates were made for several factors that have commonly led to actual harvest volumes from timber sales being less than the volumes estimated during project planning (see Forest Plan FEIS, Chapter 3: "Timber" and Appendix B). These "modeling implementation reduction factors" (MIRF's) were applied to each Forest Plan alternative, and for each Administrative Area of the Tongass. Using these MIRF's to estimate actual volumes available over time should result in close correspondence between planned timber harvesting and the volumes actually achieved during harvest implementation. Harvest volume "falldowns" experienced in recent years are not anticipated to occur from the Luck Lake Project.

Planning for the Luck Lake Project has accounted for nearly all acreage deferrals and deletions through interdisciplinary field review. Deferral of harvest to meet Forest Plan standards and guidelines occurred early in the process, and additional deferrals due to suitability factors such as very high hazard soils, low site index, and buffers for unmapped streams were accounted for during field review of the proposed units. Few, if any, additional deferrals due to suitability factors are expected.

The use of harvest prescriptions other than clearcut is fully accounted for in this analysis. VCU's 572 and 581 will retain a minimum of 30 percent overstory canopy cover and VCU 582 will retain a minimum of 10 percent canopy cover with the application of Forest Plan standards and guidelines. There are no units utilizing traditional clearcut prescriptions.

Economic deferral is dependent on changing economic conditions including log prices, the cost of accessing harvest units (roads), and the efficiency of harvest systems (including yarding and hauling costs). The economics of timber harvesting varies considerably over the

short- and long-term and its effect on overall timber supply is difficult to quantify accurately. The Forest Plan divides the allowable sale quantity into two non-interchangeable components (NIC's) based on economic factors, and requires the two NIC sale volumes to be kept separate for planning and accounting purposes. No NIC II (less economic) volume is planned for the Luck Lake Project Area at this time. Additional economic deferral has been accounted for during field review and development of alternatives. The actual final economic deferral will depend on how individual sale area boundaries are defined. In some cases, economic deferral can be reduced or minimized if lower value areas can be combined with higher value areas and economic logging methods are chosen.

Effects Relative to Logging Systems

All yarding is proposed in conformance with national and regional standards and guidelines. Yarding systems were assigned through interdisciplinary analysis to minimize potential effects, and special yarding requirements are specified on the unit cards (see Appendix B). On-site ground reconnaissance and actual field evaluations during the planning and layout process will ensure the yarding system assigned provides the required suspension to meet management objectives. (Effects resulting from logging systems are discussed in the Soils and Water sections.)

Harvest acres by yarding system are shown in Table Silv-3. Shovel yarding is minor to nil, associated only with right-of-way clearing. All action alternatives use running skyline, the most economical cable system commonly in use, for a substantial portion of their total harvest (34 to 58 percent). The proportion is highest for Alternative 5, which emphasizes small, relatively economical sale opportunities. All action alternatives also use other cable systems to some degree; these normally represent units for which running skyline did not meet yarding requirements. Helicopter logging is substantial in Alternatives 3, 4, and 6 (35, 31, and 31 percent); in Alternative 3 because it minimizes new road construction (in relation to the amount of harvest volume); in Alternatives 4 and 6 because it maximizes timber harvest volume.

Table Silv-3
Acreages of Logging Systems by Alternative

Yarding Type	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Running Skyline	246	294	413	252	413
Other Cable	89	164	291	178	291
Helicopter	91	306	322	0	322
Shovel	19	4	19	0	19

Opportunities for Small Sales

All action alternatives would have their harvest units and volumes offered in more than one sale, with the intent of having different sized offerings to meet the needs of different types of purchasers. Table Silv-4 displays the maximum number of sales by alternative, their range in size, and their average size. Alternatives with higher volumes have more flexibility to offer more and smaller sales.

In addition to these sales, and under any alternative (including Alternative 1), the Thorne Bay Ranger District has an annual salvage and small sales program of approximately five million board feet which provides many small sale opportunities.

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Table Silv-4
Estimated Numbers and Sizes of Sales by Alternative

	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Maximum Number of Sales	8	15	18	7	18
Smallest Offering (MBF)	144	40	42	650	42
Largest Offering (MBF)	2,440	2,440	2,440	2,440	2,440
Average Sale Size (MBF)	931	866	941	1,059	941

Timber Economic Efficiency Analysis

Current Forest Service Handbook direction (FSH 2409.18; Amendment 90-1 and Supplement 6) requires an economic efficiency analysis to compare benefits and costs of a project. Values used in the analysis must reflect "middle market" (or mid-market) timber value estimates based on median or middle-level timber market values. In order to account for market fluctuations, weighted average timber values over the past 10 years are used. Handbook direction also stipulates that timber harvest projects provide at least 60 percent of normal profit, which must be included when calculating costs. The economic efficiency analysis compares expected gross revenues against estimated costs and arrives at an estimate of net revenues.

Table Silv-5 displays the major timber sale cost components for each action alternative. The "transportation costs" component includes "stump-to-truck" logging costs, such as felling, bucking, yarding, loading, and administration, and related costs such as haul, dump, tow and raft costs. "Construction costs" include all capital investments; for the Luck Lake Project these include road construction and reconstruction, and bridges.

Dividing total costs by total estimated harvest volume gives an average cost per thousand board feet for each alternative. This cost-per-board-foot measure can be used to compare the overall economic efficiency of the alternatives. This cost is highest in Alternatives 4 and 6, which attempt to maximize timber harvest volume and thus accesses more economically marginal units (many requiring helicopter or long-span cable systems) with considerably more roading than the other alternatives. Alternative 3, on the other hand, minimizes new road construction relative to volume harvested and has the lowest cost per thousand board foot. Alternatives 2 and 5 are fairly comparable, falling between the two extremes but closer to the low end. Alternative 5 uses no helicopter logging, and has a goal of providing economic small sales, whereas Alternative 2 spreads its harvest more equally between running skyline, other cable, and helicopter systems.

Table Silv-5
Summary of Timber Harvest Costs by Alternative

Alternative	Harvest Volume (MBF)	Transportation Costs* (Million \$)	Construction Costs** (Million \$)	Cost Per MBF (\$)
2	7,598	1.10	1.11	290.86
3	14,453	2.50	0.91	235.94
4	17,884	4.14	2.96	397.00
5	7,611	.93	1.27	289.06
6	17,884	4.14	2.96	397.00

* Transportation costs include all costs not associated with capital investments or costs normally connected to road construction, such as: fall, buck, yard sort, load, haul, dump, raft, and tow.

** Construction costs include costs associated with road construction and reconstruction, such as: pit development, clearing, grubbing, embankment, haul, excavation; and related structures such as bulkheads, bridges, and culverts.

Middle market timber values (actually, any market timber values) depend on several variables, including the type of logging system, tree species harvested, and timber stand average volume. A detailed mid-market analysis has been conducted and is included in the project planning record. The results of this analysis by alternative are displayed in Table Silv-6. In this table, "pond log value" represents the delivered price of logs at the mill less the cost to manufacture them into useable products. Pond log values are closely related to log size, grade, and species.

Estimated net timber value (stumpage) is arrived at by subtracting all associated costs from the pond value for all proposed harvest units in each action alternative. Consequently, individual units which may be uneconomical to harvest by themselves are offset by combining them with other units which are more economical to harvest. This results in less productive land or land where the timber is highly defective being made more economically viable for timber harvest. These lands are then brought under management, thereby increasing future timber yields and postponing entry into more environmentally sensitive areas. Alternatives 4 and 6 make the greatest contribution in this regard, but also have the lowest net value. Alternative 3 also includes such lands, limited to being accessible from the existing road system.

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Table Silv-6
Estimated Net Timber Values of the Alternatives*

Alternative	Pond Log Value (Per MBF)	Total Project Cost** (Millions)	Net Value (@Mid-market)	Net Value (@Current Market)
2	375.78	2.2	37.71	31.18
3	376.30	3.4	53.40	46.60
4	376.29	7.1	-56.79	-80.59
5	376.31	2.2	26.58	19.78
6	376.29	7.1	-56.79	-80.59

*All figures are in dollars (\$).

** Transportation and construction costs from Table Transportation-2

These projected construction costs, transportation costs, and pond log values are estimates, not actual costs. These estimates are useful for comparing the alternatives. Before the timber is sold, the volume within the units and rights-of-way will be cruised and appraised to determine the actual volume and value of the timber. Because all action alternatives are measured against the same yardstick of estimated costs, it is appropriate to rank the alternatives in order by net value (either mid-market or current market). Alternative 3, which minimizes costs associated with road construction relative to the amount harvested, has the highest net value. Alternatives 2 and 5 are somewhat lower, but still positive. Alternatives 4 and 6, with considerably higher transportation and construction costs, show a negative net value under both markets. The mid-market value is an average between the highest and lowest timber values over the last 10 years. The current market value is the lowest value recorded during this period.

Socioeconomics

Affected Environment

Socioeconomic Setting

The Luck Lake Project Area is on the northeast coast of Prince of Wales Island. It is accessible by road from communities on Prince of Wales Island, and secondarily, via the Alaska ferry system, from larger communities such as Ketchikan and Wrangell. However, while accessible to many potential users, survey information shows that the principal users are from the north Prince of Wales Island communities of Coffman Cove, Thorne Bay and Whale Pass (based on the community use information in the Communities section of the Forest Plan FEIS, pp. 3-529 to 3-680, as is the information below). Community use of the area, such as for recreation, hunting, or subsistence, is discussed in the Recreation, Scenery, and Subsistence sections of this chapter.

The communities of Coffman Cove, Thorne Bay, and Whale Pass have economies that are directly or indirectly reliant on logging. These communities began as logging camps, and although other means of employment have developed (such as commercial and sport fishing, education, and forestry), logging-related jobs are the mainstay. Based on 1995 data, the populations of the three communities are: Coffman Cove - 254; Thorne Bay - 650; and Whale Pass - 92. Median household incomes, based on 1990 census data, are: Coffman Cove - \$44,063; Thorne Bay - \$39,688; and Whale Pass - \$49,583.

There is no comparable community-specific employment information available. The closest is subregional information for all north Prince of Wales Island communities combined (Forest Plan FEIS, pp. 3-514 to 3-516). In 1995, there were 447 wage or salary jobs in the subregion. Of these, 257 (57 percent) were wood products-related jobs. This is one of the highest ratios of logging-related jobs to all jobs in Southeast Alaska.

Environmental Consequences

Employment and Income Effects

Effects related to community uses of the area are discussed in other sections of this chapter, as noted above. The proposed action would have no direct or indirect employment or income effects other than for what is logging-related. To estimate the amount of employment and income likely to result from timber harvest alternatives, a simple conversion of board feet to jobs and income is made, using multipliers developed for Southeast Alaska. Table SE-1 below shows the employment and income estimates for the action alternatives. As would be expected, the higher the harvest, the more jobs and income that result.

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Table SE-1
Logging-related Employment and Income by Action Alternative

	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Employment (# jobs)	48	92	110	48	110
Income (Million \$)	1.73	3.29	3.94	1.72	3.94

Soils

The following discussions and analysis are based on and summarized from the Soil, Floodplain, Riparian, and Wetland Resources Report for the Luck Lake Project (1998), and the Watershed Analysis for the Luck Lake Project Area (1998). These reports include more detailed analyses and references to the scientific literature. A Forest-wide treatment of soils may be found in the Forest Plan FEIS, Chapter 3. Applicable soils direction is included in the Forest Plan, Chapter 4 and Appendix C. The unit and road cards (Appendices B and C of this document) contain additional site-specific implementation requirements.

The soils of the Luck Lake Project Area are predominantly underlain by till at elevations less than about 1,000 feet. The upper limits of glacial till on the valley sides of the Luck Lake watershed is 700 to 1,500 feet. The thickness of the till deposits is extremely variable, ranging from a few inches to 30 feet or more. As elevations increase and slopes steepen, soils are typically less than 20 inches thick and underlain by bedrock. On the broad, gently sloping ridgetops organic soils have accumulated, typically to depths of two to four feet. An overview of the geomorphology of the Project Area is included in the Karst Resources and Geology section of this chapter.

Affected Environment

Soil Productivity

Soil productivity in the Project Area is primarily a function of soil drainage and soil depth. Road construction and rock pit development cover areas of soil with rock and overburden, reducing the productivity of the site. Soil disturbance within harvest units can have a detrimental impact on soil productivity. Soil disturbances are areas where felling of trees or yarding of logs has displaced the surface organic mat.

Roads and rock pits currently occupy 506 acres or 1.4 percent of the Luck Lake Project Area (assuming a disturbed soil width of 40 feet for each road). If roads are abandoned, red alder will grow on most road surfaces of the Project Area. Approximately 18 percent of the road system (91 acres) is closed and is overgrown with alder or in the process of being overgrown.

Forested, poorly-drained organic soils are extensive in the Luck Lake Project Area: 5,349 acres have been mapped. On the Luck Lake Project Area, 1,299 acres of forest on these sites have been logged. Concerns with timber harvest on these soils include the ability of the site to grow 20 cubic feet of wood (on average) per acre per year. The environmental consequences of timber harvest on these sites are discussed in the Water section of this chapter.

Approximately 64 acres of McGilvery soils have been mapped in the Luck Lake Project Area. These soils consist of well drained organic matter less than 20 inches thick over bedrock. Dragging logs across areas of thin McGilvery soils can physically displace the soil from a spot or yarding corridor. Field reconnaissance identified several small areas of McGilvery soils within and adjacent to proposed harvest units. Where soil displacement would likely exceed Regional Soil Quality standards the area of McGilvery soil was not included in the harvest unit.

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Surface Erosion and Mass Movement

The relatively thick organic mat covering most mineral soils in the Project Area helps prevent surface erosion. Where the organic mat is displaced or mineral soils exposed, surface erosion can occur. Yarding of logs can displace the organic mat and allow surface erosion of underlying mineral soils. In steep forested terrain with high soil water levels, mass wasting (landslide) is the dominant erosion process. Topographic, geologic, and soil conditions usually determine where a landslide will occur; rainfall is probably the principle triggering force determining when landslides will occur.

Steep forested terrain occurs throughout the Luck Lake Project Area. An inventory of landslides in the Project Area found a landslide rate of one slide per 2,812 acres of productive old-growth forest and one slide per 496 acres of harvested second-growth forest. The slides in old growth averaged 0.6 acres and those in second growth 0.2 acres. Over the 20-year period covered by the inventory five 1-acre landslides occurred on nonforested land.

Naturally unstable areas in the Luck Lake Project Area include the lands between 700 and 1,500 feet elevation in the Luck Creek basin, the headwaters of the Coffman Creek watershed, and the avalanche area visible from the 30 road at Ratz pass. The majority of the old-growth landslides occurred in the east and west forks of Luck Creek.

The Forest Service uses a mass movement index for preliminary identification of potentially unstable sites in a Project Area. The highest hazard soils (most mineral soils on slopes over 72 percent, and some on slopes over 60 percent) are not included in the suitable timber base. All proposed harvest units with slopes over 50 percent gradient or with some indication of instability were field reviewed by a soil scientist. Numerous areas of instability were identified and excluded from proposed harvest units. The soil scientist's unit reconnaissance reports (contained in the planning record) document the changes made to the initial group of proposed harvest units. Ten proposed harvest units contain inclusions of areas with slopes greater than 72 percent considered to have a low landslide potential by the soil scientist and which are thus suitable for timber harvesting. These inclusions, identified on the unit cards (Appendix B) range in size from one to ten acres.

Environmental Consequences

Soil Productivity

Indicators of adverse effects on soil productivity include acres of new roads and rock pits, and soil disturbances over 100 square feet. These measures are displayed for each action alternative in Table Soils-1. For roads and rock pits, the analysis assumes 4.8 acres per mile of road, and one 2-acre rock pit for every 2 miles of road. Soil disturbances larger than 100 square feet, called soil displacements, are considered detrimental to soil productivity (Region 10 Soil Quality Standards). The analysis assumes five percent displacement for areas where partial suspension yarding is planned and two percent displacement for areas where full suspension is planned. These are rough estimates based on timber harvesting on very steep slopes; in all likelihood soil displacement on gentler slopes will be much less.

Table Soils-1
Effects on Soil Productivity by Action Alternative

Alternatives	Productivity Loss from Roads (acres)	Displaced Soils from Harvest (acres)	Rock Pits (number)
2	30	23	3
3	23	33	3
4	80	43	7
5	36	22	3
6	80	43	7

The intent of the Regional Soil Quality Standards is to maintain soil productivity within acceptable parameters. The standards allow up to 15 percent of the productive forest land to be in a detrimental condition. For harvest units on north Prince of Wales Island, typically less than five percent of the soils in steep slope timber harvest units are left in a detrimental condition. In addition, for the Luck Lake Project, marten and goshawk standards and guidelines require partial cutting for all harvest units; helicopter yarding will be required to harvest many of the partial cut units, further reducing potential detrimental effects. Soil displacements and other adverse impacts to soils within harvest units are anticipated to be within Soil Quality Standards.

Surface Erosion and Mass Movement

Harvest on over-steepened slopes (72 percent or greater) is generally avoided, as these lands are considered unsuitable for timber harvest. Forest Plan standards and guidelines allow harvest on over-steepened slopes when on-site analysis determines that the potential for adverse effects is low. Field reconnaissance by the soil scientist has identified specific areas with slopes 72 percent or greater that have low landslide potential. The proposed harvest on slopes over 72 percent by action alternative is: Alternative 2 - 26 acres; Alternative 3 - 49 acres; Alternative 4 - 50 acres; Alternative 5 - 16 acres; and Alternative 6 - 50 acres (Table Soils-2).

Table Soils-2
Acres of slopes over 72 percent gradient identified as suitable for timber harvest by the IDT Soil Scientist. (Field estimates)

Unit Number	Acres of Slopes over 72 %	Watershed Number	Included in Alternative
572-412	3	BT2A	3,4,5,6
572-425	1	outside project	3,4,6
581-417	10	C27B	3,4,6
581-422	2	C26C3	3,4,6
581-423	2	C27B	2,3,4,5,6
581-428	10	C26C3	2,3,4,5,6
581-440	3	C27B	2,3,4,6
581-449	10	C27B	2,3,4,6
581-452	8	C26C2	3,4,6
582-404	1	C27A	2,4,5,6

Landslide rates within the Project Area were discussed under "Affected Environment." Factors affecting the landslide rate in future harvest units include the amount of timber harvest on steep slopes and the amount of soil disturbance in harvest units. Log

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suspension requirements will reduce the amount of soil disturbance, and partial cut harvest is prescribed for all units, further helping to maintain the root mat in harvested areas.

The analysis here assumes that one landslide will occur in the next 20 years for each 496 acres of timber harvested (or, one landslide per year per each 9,920 acres of harvest.) The average size of the second growth landslides is 0.2 acres. The analysis also assumes that one 0.6-acre landslide will occur in the next 20 years for each 2,812 acres of old growth; and that five 1-acre landslides will occur in the nonforested areas of the Luck Lake Project Area.

Applying these assumptions to the alternatives, including Alternative 1 (no-action), results in essentially no difference in estimated landslide effects (occurring over the next twenty years) between alternatives. Landslides in second-growth areas (including existing second growth) range from 4.0 to 4.3 acres; landslides in old-growth areas range from 2.9 to 3.0 acres; and landslides in nonforested areas would be 5.0 acres. Overall, total estimated landslide acres range from 12.0 acres (Alternative 1) to 12.3 acres (Alternatives 4 and 6). More landslides will occur in second growth, but due to their smaller average size the difference in total acres between alternatives is slight.

Cumulative Effects

Soil Productivity

Assuming all suitable forest land in the Project Area is harvested by 2054, and extrapolating the amount of road needed to access the remaining suitable lands, the Project Area could have 139 miles of road (50 more miles than currently exist). This is about 675 acres of forest land occupied by roads, or 1.9 percent of the Project Area.

Mass Movement

The preceding analysis of landslides can be carried farther into the future on the same assumption of future timber harvest. Smaller slides within second growth would occur somewhat more frequently, and larger old-growth forest slides somewhat less frequently, but the difference in total landslide acres between harvesting the remaining suitable acres and not harvesting them would be insignificant. (See also the Water section of this chapter for cumulative watershed effects.)

Mitigation

Soil resource protection prescriptions, landslide mitigation measures, and applicable Best Management Practices (BMP's) are listed on unit and road cards and in the soil resource reconnaissance reports. Due to the relatively thick organic mat covering most mineral soils, surface erosion is limited to detrimentally displaced areas, roads, stream banks and recent landslide tracks. Detrimentially displaced areas within timber harvest units are routinely slashed and seeded shortly after they occur. Slashing the disturbed site provides soil cover, reducing the force of raindrop impact and the length of exposed slope. Grass seeding and fertilizing the area further provides soil cover and provides some organic matter for soil rehabilitation. Other BMP's are intended to keep surface erosion to a minimum practicable amount.

Subsistence

The following discussions and analysis are based on the detailed subsistence information and analysis contained in the Forest Plan FEIS, Chapter 3: "Subsistence" and "Communities," Appendix H, and the "Deer Harvest Map" in the map packet. See also the Wildlife section of this chapter for additional analysis of deer and other wildlife species.

Affected Environment

Subsistence and ANILCA

Subsistence is a broad term applied to many natural resource uses of rural Alaskans. In the Alaska National Interest Lands Conservation Act (ANILCA), subsistence is defined (in part) as: "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation" (ANILCA Sec. 803). ANILCA provides for the continuation of these uses "consistent with sound management principles, and the conservation of healthy populations of fish and wildlife" (ANILCA, Sec. 802). For many rural Alaskans subsistence is a way of life; for many rural Alaskans it also carries cultural and religious meaning.

The analysis of subsistence uses and resources on National Forest land, and of potential effects resulting from management activities, is also required by ANILCA (Sec. 810). This analysis typically focuses on food-related resources, which are the ones more likely to be affected due to loss or alteration of habitats from land-altering activities. (The identification, protection and interpretation of cultural and historic resources on federal lands are covered under other legislation, including the National Historic Preservation Act. See the Other Resources section of this chapter.) The analysis also typically focuses on three factors: abundance and distribution of the resources, access to them, and competition for the use of them. Under ANILCA, if it is found that a significant restriction on subsistence resources may occur (from a specific project or cumulatively for a geographic area), additional analysis and findings are required.

The Forest Plan FEIS provides a comprehensive analysis of subsistence resources and potential effects, both Tongass-wide and for each rural community of Southeast Alaska. That analysis concluded that Forest-wide, under full implementation of the Forest Plan, the only subsistence resource that may, in the future, be significantly restricted is subsistence use of deer (Forest Plan FEIS, pp. 3-224 to 3-229; Forest Plan Record of Decision, pp. 36-37). The following is tiered to this analysis.

Subsistence Resources and Uses

Analyses of the fish and wildlife resources of the Project Area are found under those headings in this chapter. Salmon and trout are the principal subsistence fish resources of the area; they are harvested in both fresh and saltwater in the Project Area throughout the year. The principal subsistence wildlife resources of the Project Area are deer, black bear, and smaller furbearers such as marten. However, except for deer, use of these species for subsistence purposes is relatively minor. (Forest-wide, measured by weight, deer account for 21 percent of subsistence food resources, and all other land mammals 4 percent (Forest Plan FEIS, p. 3-224).) Potential effects to any of these fish and wildlife species as subsistence resources are discussed under "Effects of the Alternatives" below.

Community use of deer for subsistence purposes is well documented and studied for the rural communities of Southeast Alaska (see Forest Plan FEIS, pp. 3-210 to 3-223 and 3-523 to 3-528). Community use of specific geographic areas for obtaining deer is estimated by the wildlife analysis areas (WAA's) used by the State of Alaska. For the purposes of the wildlife

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analysis of Luck Lake alternatives, the Project Area is assumed to be represented by WAA 1420 (the Luck Lake Project Area actually corresponds to 97 percent of this WAA).

Community use of each WAA for deer is displayed on the "Community Deer Harvest" map included with the Forest Plan FEIS (map packet). The map shows that three communities (or community groupings) each make up about 30 percent of the total use of WAA 1420: Coffman Cove, Craig and Klawock, and Ketchikan. No other community accounts for more than about five percent of the use. Community use is further discussed and displayed in the Forest Plan FEIS in the "Communities" portion of Chapter 3 (pp. 3-523 to 3-685) and in Appendix H. Appendix H identifies for each community those WAA's (ordered by highest to lowest use) accounting for 75 percent of that community's deer harvest. Of the communities listed above (or others, such as Thorne Bay, in the vicinity of WAA 1420), WAA 1420 shows up for only one, Coffman Cove.

It can be said, then, that Coffman Cove is the only one of the communities representing a substantial portion of the deer harvest occurring in WAA 1420 for which that harvest makes up a substantial portion of its historic deer use. (All future demand projections are extrapolations based on current use and population growth.) The discussion of potential effects on the subsistence use of deer in the Project Area will thus focus on Coffman Cove as the only community potentially significantly affected.

Environmental Consequences

Direct, Indirect and Cumulative Effects

The analysis of effects is based on the ANILCA categories previously mentioned: abundance and distribution, access, and competition. No restrictions on access to the Project Area for subsistence uses are anticipated. The area is accessible by passenger vehicle from Coffman Cove and other Prince of Wales Island communities (via forest development roads 30 and 3030), and the State ferry system connects Prince of Wales Island to Ketchikan and the mainland. Within the Project Area some secondary roads are proposed for closure under the access management plan (see discussion of access management in the Transportation section of this chapter). These closures would apply to motor vehicles only, and do not restrict access by other means.

Abundance and Distribution

With application of the riparian standards and guidelines of the Forest Plan, no significant adverse effects on salmon or trout species are anticipated under any alternative, or cumulatively (see Fish section of this chapter). For wildlife species, the use of small old-growth habitat reserves (part of the Forest Plan habitat conservation strategy) and species-specific standards and guidelines (including marten and goshawk) result in no significant adverse effects anticipated for wildlife species other than deer (see Wildlife section of this chapter).

Declines in deer habitat capability are measurable and will occur under all action alternatives. (Details of the analysis of deer habitat effects can be found in the Wildlife section of this chapter.) These declines represent a cumulative trend which has occurred and will continue to occur with the harvest of old-growth timber. For key deer winter habitat, the most important habitat component in the Project Area, declines are minimized in several ways. Implementation under the Forest Plan requires 1,000-foot beach and estuary fringe no-harvest zones along all saltwater beaches and estuaries, the application of riparian buffers along all streams, and the location of a small old-growth habitat reserve in each VCU (major watershed). All these result in at least some protection of important deer winter habitat. The Luck Lake Project further minimizes effects to deer winter habitat by redesigning, and in one

case relocating, two of the small old-growth habitat reserves to include more high value deer winter habitat (see also Biodiversity and Old Growth section of this chapter).

Competition

In addition to these measures minimizing loss of key deer winter habitat in the Project Area, deer habitat decline must also be put in the perspective of subsistence use of deer in the area. As discussed under Affected Environment above, only one Southeast Alaska community, Coffman Cove, relies on subsistence deer harvest in the Project Area for a substantial portion of its subsistence food needs.

Historic amounts of deer harvested, and potential direct and cumulative effects of full implementation of the Forest Plan (as Alternative 11) in conjunction with the anticipated future demands for deer, are displayed and discussed for each Southeast Alaska community in the Forest Plan FEIS. Three levels of deer use are evaluated for each community for those areas (WAA's) the community most relies on: use by community residents only, use by all rural (subsistence) hunters, and use by all hunters (including those from non-rural communities and hunters from out of State, neither of whom are considered subsistence users under ANILCA). Under ANILCA, a priority for use will be granted to rural users if restrictions on use of a resource are necessary. If further restrictions on a use were necessary, then that is the point at which a significant restriction on subsistence uses may occur. Such a restriction could occur from either reduced abundance (measured by habitat capability) or increased competition (measured by rural hunter demand).

In order for an area (in this case a WAA) to produce on the average enough deer for species viability, as prey for other wildlife species (primarily wolf), and for human uses (subsistence and other hunting), deer harvest by humans must not exceed a certain average percentage of the habitat capability for that area. The Forest Plan FEIS analysis makes two assumptions in this regard (p. 3-537):

- Hunters in areas where harvest or demand is within 10-20 percent of habitat capability may experience reduced hunter efficiency and moderate difficulty in obtaining deer.
- In areas where demand (or current/historic use) exceeds 20 percent of habitat capability, deer harvest may be restricted either directly or indirectly.

The analysis for Coffman Cove (Forest Plan FEIS, pp. 3-536 to 3-537, and H-65) shows that current (historic) use of WAA 1420 for Coffman Cove alone is 5.2 percent of habitat capability, and for all rural users 7.4 percent. By the year 2005 (assuming full Forest Plan timber harvest, including the Luck Lake Project), with habitat capability down slightly and demand up slightly, use by Coffman Cove residents is at 6.5 percent of habitat capability, and by all rural users 9.2 percent. Thus for short-term cumulative effects (the Luck Lake Project and all past projects), no restrictions on use by subsistence hunters would occur. (Demand including all hunters, rural, non-rural, and nonresident, is at 13.4 percent in 2005. Some effects from competition could begin to be seen, but not likely enough for the subsistence priority to be invoked.)

After 100 years of full implementation of the Forest Plan (long-term cumulative effects), demand by Coffman Cove residents is projected to reach 13.2 percent of habitat capability, and by all rural users of the area to reach 18.9 percent. Demand by all hunters is projected to be at 27.6 percent, and it is possible that by this time (the year 2095) the subsistence priority for deer hunting in WAA 1420 may be in effect. However, use by all subsistence hunters would still be below the 20 percent threshold discussed above.

Based on the preceding analysis, this DEIS is tentatively concluding that no significant restrictions on any subsistence resource within the Project Area, from past, current and

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reasonably foreseeable future actions, will occur. A final ANILCA determination will be made in the project Record of Decision.

Threatened and Endangered Species

The following discussions and analysis are based on and summarized from the Wildlife Resources Report for the Luck Lake Project Area (1998), a more detailed treatment referenced to the scientific literature. This report also includes the Biological Assessments required for all threatened and endangered species, and the Biological Evaluations required for Forest Service sensitive species. Direction for threatened, endangered and sensitive species is contained in the Forest Plan, Chapter 4.

Affected Environment

Federally listed threatened and endangered species are those plant and animal species formally listed by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS), under the authority of the Endangered Species Act of 1973, as amended. Candidate species are those being considered for listing as threatened or endangered by the USFWS and NMFS. Species of concern are those species (formerly known as Category 2 Candidate species) for which there is information indicating the species might qualify for endangered or threatened status, but for which further evaluation is needed. The State of Alaska has an Endangered Species law which authorizes the commissioner of the Alaska Department of Fish and Game (ADF&G) to list Alaska endangered species. The Regional Forester can also designate species occurring in National Forests as "Sensitive."

No threatened, endangered, or candidate fish species are found in the freshwater river systems in the Project Area. Two threatened species, the Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*) and the Snake River spring/summer Chinook salmon, and one endangered species, the Snake River sockeye salmon (*O. nerka*), may be present in the general vicinity in saltwater during the marine rearing period of their life cycle. However, the presence of these Pacific Northwest salmon is not documented for these waters. No threatened, endangered, or candidate plant species are known to occur in the Project Area.

Biological Assessments have been prepared to evaluate the effects of the proposed action on three federally-listed threatened or endangered species. These species are discussed below, based on the information in these assessments. A Biological Assessment for the American peregrine falcon has been submitted to USFWS, and Biological Assessments for the humpback whale and Steller sea lion to NMFS. No other threatened, endangered, or candidate birds or mammals are known to occur in the Project Area.

The Arctic peregrine falcon was delisted in 1994, and the Endangered Species Act requires monitoring of species for five years following delisting. The Arctic peregrine falcon is primarily associated with the area north of the Brooks Range and Seward Peninsula in interior Alaska. It occurs in Southeast Alaska only during migration periods.

Humpback Whale

Humpback whales (*Megaptera novaeangliae*) are occasionally found in waters bordering the Project Area. The local distribution of humpbacks (listed by NMFS as Endangered) in Southeastern Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring (*Clupea harengus*) and euphausiids (shrimp-like crustaceans). Important feeding areas include Glacier Bay and adjacent portions of Icy Strait, Stephens Passage/Frederick Sound, Seymour Canal, and Sitka Sound. Other areas of Southeastern Alaska may also be important for humpbacks and need to be evaluated. None of these are within or adjacent to the Project Area.

Threatened or Endangered Species

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Steller Sea Lion

Steller sea lions (*Eumetopias jubata*) are also occasionally found in waters bordering the Project Area. The Steller sea lion (listed by NMFS as Threatened) ranges from Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, the Gulf of Alaska, Southeast Alaska, and south to central California. Information on Steller sea lion population trends in Southeast Alaska is limited, but suggests that Steller sea lion populations are stable in Southeast Alaska. There are no known Steller sea lion haul out areas in the Project Area; the closest is located on the south tip of Grindall Island (at the south tip of Kasaan Peninsula), about 40 miles to the south.

American peregrine falcon

The American peregrine falcon (*Falco peregrinus anatum*) may migrate through the Project Area. It is listed as threatened by USFWS. This falcon is primarily associated with interior Alaska for breeding, nesting, and rearing of young. It is highly migratory, wintering as far south as northern Argentina, and it occurs in Southeast Alaska only during migration periods. Population numbers of the American peregrine falcon are continuing to increase; in Alaska, population numbers have increased three-fold since the species was listed.

Sensitive Species

Species listed as sensitive by the Regional Forester that may occur within the Project Area are Peale's peregrine falcon, Queen Charlotte (northern) goshawk, trumpeter swan and choris bog orchid. However, only the trumpeter swan and goshawk among the animal species are expected to occur in the Project Area for extended periods of time. Choris bog orchid populations have been documented in the Project Area. Biological Evaluations, which focus on the likelihood of sensitive species becoming threatened or endangered, are required for potentially affected sensitive species, and have been completed. These are summarized below.

Trumpeter Swan

The trumpeter swan (*Cygnus buccinator*) is the largest waterfowl species in the world. Its present range is only a vestige of the once vast region of North America that it frequented in both summer and winter. Trumpeter swans breeding in Alaska spend the winter along the Pacific Coast from the Alaska Peninsula to the mouth of the Columbia River, where they take advantage of open waters of saltwater estuaries and freshwater lakes and rivers. Trumpeter swans are present in the Project Area primarily during the fall and early spring migration periods and during winter.

Trumpeter swans arrive in the area in mid-October as they are migrating south. Numbers increase as migration continues. Swans typically leave for their breeding area by mid-April. Records show swans using Luck Lake during the winter and during spring and fall migration. Swans that spend the winter usually move to estuaries or saltwater-influenced lakes such as Sweetwater Lake after freeze up. Swans have not been reported during the summer.

Queen Charlotte Goshawk

The Queen Charlotte goshawk (*Accipiter gentilis laingi*) is a raven-sized raptor associated with forests having tall trees and dense canopies. These features allow goshawks to hunt beneath the tree canopy, and to capture prey before the prey escapes into the trees or shrub layer. The dense canopy in tall trees fosters a more abundant prey species population and provides a microclimate suitable for nesting. Goshawks forage over home ranges that are typically 6,000 to 8,000 acres, though home range may be twice that size in fragmented forests.

The northern goshawk has been listed as a Species of Concern for all of its range, including the Queen Charlotte subspecies which is present in Southeast Alaska. Following a petition for listing, and appeal of an initial not warranted determination, the USFWS issued a 1997 decision that listing the species as threatened or endangered at this time is not warranted.

Broadcast and overlook surveys were completed on 49 points in portions of the Luck Lake Project Area in 1997, following Tongass National Forest protocols for the northern goshawk. Of the 43 potential harvest units, 36 contained at least one broadcast or overlook station. Field crews found no goshawk nests. A crew recorded one goshawk detection on April 7, 1997, near Unit 581-404. Follow-up surveys in the area did not locate a nest or record additional goshawk detections.

Choris Bog Orchid

In Alaska, this bog orchid species (*Platanthera chorisana*) is limited to the Aleutian Islands and southern coastal areas. Recent botanical surveys on Prince of Wales Island have identified a number of populations of this species, including 23 sites within the Project Area. With the increasing number of observations, this species may not be as rare as previously thought. Botanical surveys have identified populations of choris bog orchid adjacent to Units 572- 405, 420, 421 and 419; 581- 448, 445, 446, 441, 423 and 420; and 582- 404.

There are several USFWS Species of Concern potentially inhabiting the Project Area. Two of these are discussed elsewhere: the northern goshawk above, and the Alexander Archipelago wolf in the Wildlife section of this chapter. The others are discussed below.

Keen's Myotis

Records suggest that the range of Keen's myotis (*Myotis keenii*) is restricted to Pacific coastal forests from western Washington to Southeastern Alaska (Nagorsen and Brigham 1993 and van Zyll de Jong and Nagorsen 1994, as cited by Parker and Cook 1996). Single specimens have been collected at Wrangell, on northern Prince of Wales Island, and at Hoonah (Parker and Cook 1996). Parker and Cook (1996) suggest these bats are year-round residents. Keen's myotis apparently roosts in snags, hollow trees, rock crevices and caves (van Zyll de Jong 1985, and cited in Parker 1996).

Marbled Murrelet

The marbled murrelet (*Brachyramphus marmoratus*) is a robin-sized seabird that is found throughout the North Pacific; the North American subspecies ranges from Alaska's Aleutian Islands to central and occasionally southern California. The marbled murrelet feeds in near-shore ocean areas, inland saltwater, and occasionally inland freshwater lakes. The bird feeds below the water's surface on small fish and invertebrates. In the Pacific Northwest and Southeast Alaska, the bird normally nests in old-growth forests. Murrelets have been observed in the saltwater within the Project Area, and it is likely that nests exist on land, although no nests have been found in the Project Area.

Based on at-sea surveys, 85 percent of the estimated 300,000 marbled murrelets in North America occur in Alaska, with approximately 96,000 in the Alexander Archipelago (Ralph et al. 1995). Another study (Aglar et al. 1995) determined the early-summer, on-water population in Southeast Alaska to be 434,129 (plus or minus 166,525). Marbled murrelet habitat requirements are not well established for Southeast Alaska, but what is known suggests that habitat for regional marbled murrelet populations is adequate.

Harlequin Duck

In Alaska, the harlequin duck (*Histrionicus histrionicus*) has been reported as a fairly common year-round resident, and at one season or another has been recorded over much of the State except the Arctic coast (Gabrielson and Lincoln 1959). The species appears to breed locally over much of southern Alaska, probably in the Aleutians, and north to Anaktuvuk Pass. Ornithologists who have worked during the spring and summer months in the Alexander Archipelago and other parts of Southeast Alaska have commented upon the numbers of these ducks, frequently stating that they were common or abundant (Gabrielson and Lincoln 1959). Harlequins nest along inland fast-moving rivers and streams, usually within six feet (but up to 60 feet) of water (DeGraaf et al. 1991).

Species of Concern

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During the winter the harlequin duck is common to abundant in the coastal waters of Southeast Alaska (Gabrielson and Lincoln 1959). Preferred winter habitat is reported to be areas along surf-pounded rocky coasts, rather than sheltered bays and fjords, where water is one to two fathoms deep and turbulent, and where bottom fauna abounds (Palmer 1975). Harlequins feed on mollusks, crustaceans, insects, fish, and echinoderms.

Olive-sided Flycatcher

The olive-sided flycatcher (*Cantopus borealis*) breeds in wooded regions from central Alaska east to Newfoundland and south to northern Baja California and central Arizona in the west, central Minnesota and northern Michigan in the central states, and North Carolina and Tennessee in the east, and winters in South America. It inhabits open coniferous forests and forest edges along lakes, streams, and muskegs. DellaSala et al. (1993) noted that the species was often observed using habitats associated with lakes and muskegs during a breeding bird study on central Prince of Wales Island.

Spotted Frog

The spotted frog (*Rana pretiosa*) occurs in or near freshwater including marshy ponds, streams, and lakes (Stebbins 1985). This species is believed to range from south of the Taku River south to other transboundary rivers and some islands of Southeast Alaska and British Columbia (Holmberg 1992). Spotted frogs have been documented in the Stikine River basin (Waters 1992). Amphibian surveys completed on Prince of Wales Island have not identified any spotted frogs.

Ascending Moonwort Fern

The ascending moonwort fern (*Botrychium ascendens*) occurs widely scattered in grassy fields up to 2,500 meters elevation in British Columbia, Ontario, the Yukon, Alaska, California, Montana, Nevada, Oregon, and Wyoming (Wagner 1993). It is unknown if this species occurs within the Project Area, although potential habitat does exist.

Environmental Consequences

The following analyses include discussions of the relevant mitigation measures from the Forest Plan. An additional mitigation discussion at the end of this section, as is included in most other Chapter 3 sections, is therefore not included.

Effects on Threatened or Endangered Species

None of the alternatives are anticipated to adversely affect the humpback whale, Steller sea lion, or American peregrine falcon. Biological Assessments for each species are included in the project planning record, and the effects analyses for each are summarized below.

As described below for the American peregrine falcon, no effect on the population or habitat of the Arctic peregrine falcon (delisted in 1994) is anticipated from any alternative.

Humpback Whale

No direct or indirect effects on whales from implementation of forest management activities under any alternative are anticipated. Forest Plan forest-wide standards and guidelines for Threatened and Endangered species provide for the protection and maintenance of whale habitats. All activities will be conducted in a manner consistent with the Marine Mammal Protection Act, the Endangered Species Act, and National Marine Fisheries Service regulations for approaching whales, dolphins, and porpoise.

One potential indirect effect has to do with the use of log transfer facilities (LTF's). A portion of the logs harvested from the Luck Lake Project are likely to be transported using existing, permitted LTF's. Two types of boat activity associated with LTF's, log raft towing and recreational boating by workers, may have an effect on whales. Log raft towing routes

are generally well established, and adverse effects from log raft towing have not been documented. Recreational boating activity from the community of Coffman Cove varies between seasons and years. Whatever additional boating may occur from workers connected with LTF transfer of logs from the Luck Lake Project would likely be indistinguishable from total recreational use.

Steller Sea Lion

No areas within the Project Area have been listed by NMFS as critical habitat for Steller sea lion. No direct or indirect effects on sea lions from implementation of forest management activities under any alternative are anticipated. Forest Plan forest-wide standards and guidelines for Threatened and Endangered species provide for the protection and maintenance of sea lion habitats. All activities will be conducted in a manner consistent with the Marine Mammal Protection Act, the Endangered Species Act, and National Marine Fisheries Service regulations for approaching seals and sea lions.

American Peregrine Falcon

The American peregrine falcon occurs in Southeast Alaska only during migration. During migration, the abundance of prey species is likely to be the primary habitat factor affecting peregrine falcons; the primary prey species are thought to be shorebirds, waterfowl, and passerine species. Forest Plan standards and guidelines provide for the protection of seabird rookeries and waterfowl concentrations, and a wide variety of passerine (perching and song) birds will be available from numerous open and forested communities under all project alternatives. No adverse effect on American peregrine falcon populations is anticipated from any alternative.

Trumpeter Swan

All Forest Plan standards and guidelines for trumpeter swan are incorporated. These direct avoiding any disturbance of trumpeter swans, particularly during nesting, brood-rearing, and wintering periods. Road building and timber harvesting will not occur within 0.5 miles of Luck Lake when swans are present (normally from November 1 to April 1).

Queen Charlotte Goshawk

All action alternatives will harvest stands capable of providing nesting and/or foraging habitat for goshawks (i.e., old-growth forests). Alternatives 2, 3, 4, 5, and 6 reduce old-growth forest in the Project Area between one and five percent from existing conditions. Forest Plan requirements for maintaining 30 percent or greater canopy cover for goshawks apply to VCU's 572 and 581. These result in the partial cut prescriptions for all units in these VCU's. Units in VCU 582 (which are only in Alternatives 4 and 6) will maintain a more limited stand structure under Forest Plan standards and guidelines for marten. In contrast to traditional clearcut harvesting, this increase in standing trees left within the units should result in better maintaining goshawk habitat conditions.

It is not known what the actual effects of timber harvest will be, other than that the total amount of undisturbed old-growth habitat will be reduced. Adverse effects are greatest under Alternatives 4 and 6, which have the most harvest acres (1,048) and several units in VCU 582 that will maintain less canopy cover. Alternative 3 harvests 857 acres using partial cutting. The other two action alternatives harvest the least number of acres (also using partial cutting), Alternative 2 with 464 acres and Alternative 5 with 431 acres.

There are no confirmed goshawk nesting sites in or near the Luck Lake Project Area. However, goshawks are extremely difficult to locate and it is possible that the Project Area includes one or more breeding territories. Any goshawk nests found during field reconnaissance or unit layout will be protected from harvest by implementing Forest Plan standards and guidelines for goshawks. These require the maintenance of an area of not less than 100 acres of productive old-growth forest (if it exists) generally centered over the nest tree or probable nest site, preferably with a multi-layered, closed canopy and providing

Effects on Sensitive Species

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Effects on Other Species of Concern

foraging opportunities for young goshawks. No commercial timber harvest is permitted, and no continuous disturbance likely to result in nest abandonment is permitted within the surrounding 600 feet from March 15 to August 15. Activity restrictions are removed for active nests that become inactive or are unsuccessful.

Choris Bog Orchid (*Platanthera chorisana*)

The chance of adverse impacts to populations of choris bog orchid resulting from project activities is moderate to high. Populations are locally scattered throughout the Project Area, and 11 harvest units contain known populations. Mitigations to lower the overall risk include excluding known populations from harvest units, using buffers and directional felling to protect plants and habitat, and redirecting P-line locations. Given the frequency of occurrence of this species in surveyed portions of the Project Area, more populations are likely in unsurveyed areas. Therefore, while specific populations of choris bog orchid may be adversely affected, the general distribution of the species will not be disrupted, and the project is not anticipated to cause a trend towards threatened or endangered status.

Northern goshawk is discussed above, and the Alexander Archipelago wolf is discussed in the Wildlife section of this chapter. The following effects analysis is summarized from the project Biological Evaluations and Wildlife Resource Report.

Keen's Myotis

Timber harvest could remove potential habitat of Keen's Myotis in the form of snags and hollow trees. The amount of habitat removed could affect individuals of the species, but is not expected to negatively affect population viability.

Marbled Murrelet

All action alternatives will harvest stands capable of providing nesting habitat (old-growth forest) for marbled murrelets. Alternatives 2, 3, 4, 5, and 6 reduce old-growth forest in the Project Area between one and five percent from existing conditions. However, even if the breeding population were reduced in proportion to the percentage of productive old-growth forest harvested under the action alternatives, populations in the Luck Lake area would still be strong, and any effects on the estimated Southeast Alaska population of marbled murrelets (434,000 plus or minus 166,000) would be negligible. (See also the previous discussion of timber harvest and canopy requirements under northern goshawk.)

Any nests located during field reconnaissance or unit layout will be protected from timber harvest and blowdown under Forest Plan standards and guidelines. A 600-foot buffer is required around each known nest, with disturbance activities minimized during the nesting season, and the buffer zone would be maintained and monitored for at least two nesting seasons following discovery. If the nest remains inactive for more than two years, the buffer protection may be removed.

Harlequin Duck

Nesting habitat for harlequin duck occurs along inland rivers and streams. Riparian habitats along all potentially affected rivers and streams in the Project Area are protected under Forest Plan standards and guidelines for riparian areas, and nesting habitat requirements are expected to be maintained. Winter habitat occurs in the marine environment, in areas of high surf and rocky beaches. No adverse effects are anticipated.

Olive-sided Flycatcher

Olive-sided flycatchers may occur in the Project Area along some of the forest edges in the spring, summer, and fall. Olive-sided flycatchers are not considered an old-growth associated species. Edge habitat alterations will be insignificant, and the project is not anticipated to affect olive-sided flycatchers or their habitat.

Spotted Frog

Riparian habitats along all lakes, rivers, and streams will be maintained through implementation of Forest Plan standards and guidelines for riparian areas. This species is not likely to occur in the Project Area, and no effect on the spotted frog is anticipated under any alternative.

Ascending Moonwort Fern

It is unknown if this species occurs in the Project Area. Potential habitat occurs in the area. Undetected specimens could potentially be affected by harvest activities, but effects are not likely to cause a trend towards listing the species.

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NOTES

Transportation

Affected Environment

Access to Prince of Wales Island and the Luck Lake Project Area is by small plane, ferry, and boat. A ferry terminal for the State of Alaska Marine Highway System is located at Hollis, south of the Project Area. The road network on Prince of Wales Island originally developed as a result of timber harvest starting in the mid-1950's. The road system connects the Project Area to Thorne Bay, Craig, Klawock, and Hollis in the south and Coffman Cove, Naukati, and Whale Pass in the north. Forest development road (FDR) 30, the major route through the Project Area, and FDR 3030, link Thorne Bay to Coffman Cove.

National Forest roads are classified based on current or anticipated use into one of three maintenance levels. (Roads may also be obliterated or otherwise returned to an unroaded condition after use.) Maintenance levels incorporate traffic service levels, as indicated in the following definitions. Applicable maintenance levels for the Project Area are:

- Maintenance Level 1 (Traffic Service Level D) - Roads are closed by bridge removal or organic encroachment and are monitored for resource protection. Basic custodial maintenance is performed to perpetuate the road and to facilitate future management activities.
- Maintenance Level 2 (Traffic Service Level C) - Roads are maintained for high-clearance vehicles and monitored for resource protection. Traffic is normally minor, usually consisting of administrative or recreational uses.
- Maintenance Level 3 (Traffic Service Level B) - Roads are maintained for travel by a prudent driver in a standard passenger vehicle and are subject to the provisions of the Highway Safety Act. Road use is by administrative and passenger vehicles, and logging trucks.

The Luck Lake Project Area currently has 89.1 miles of roads on National Forest lands. Of these, 26.3 miles are closed (level 1) and 62.8 miles are open (either level 2 or level 3). FDR 30 and FDR 3030 are generally maintained for use by passenger vehicles.

Environmental Consequences

The effects of the transportation system on other resources are considered in the specific resource sections (Fisheries, Soils, Subsistence, Water, and Wildlife). This section focuses on the effects of each alternative on the transportation system, and discusses post-project access management. None of the alternatives will have an adverse effect on the future development of a major transportation and/or utility system between Little Ratz Harbor and Coffman Cove. The Luck Lake Project does not include a proposal for or analysis of a state road corridor or any other transportation or utility system project within the Transportation/Utility System Land Use Designation.

Road Development

Table Transportation-1 displays the miles of new and reconstructed roads by alternative. In most cases, new road construction consists of extending roads less than one mile. The extension of roads 3030110 and 3030720, and construction of roads 3030210 and 3030360, are each greater than one mile. (See road cards in Appendix C for details on each road segment.) Road reconstruction consists of roadbed and ditchline repairs, culvert or bridge

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replacement, and resurfacing. Temporary roads (usually short spurs) are closed and/or obliterated after the completion of harvest.

Alternatives 4 and 6 have considerably more road construction and reconstruction than the other alternatives, including 1.61 miles of new construction and 2.6 miles of reconstruction that would occur outside the Project Area. Alternative 3 requires the least miles of new road construction, and has the fewest miles of roads overall, slightly less than Alternative 2.

Alternatives 4 and 6 would extend FDR 3030110 into the Baird Peak area for 3.66 miles, and Alternative 2 for 0.65 miles.

Table Transportation -1
Miles of New and Reconstructed Road by Action Alternative

	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	<u>New</u>	<u>Recon</u>	<u>New</u>	<u>Recon</u>	<u>New</u>	<u>Recon</u>	<u>New</u>	<u>Recon</u>	<u>New</u>	<u>Recon</u>
System Roads	4.09	1.10	2.60	2.40	13.18	5.00	5.06	2.01	13.18	5.00
Temporary Roads	1.53	N/A	1.49	N/A	2.15	N/A	1.66	N/A	2.15	N/A
Total (new and recon.)	5.62	1.10	4.09	2.40	15.33	5.00	6.72	2.01	15.33	5.00

SOURCE: GIS query

Table Transportation-2 provides a summary of the costs associated with road construction, reconstruction and maintenance (includes pre-haul and post-haul maintenance). Existing roads not requiring reconstruction generally need some form of pre-haul maintenance, such as blading and shaping the existing road surface, minor drainage repairs, and roadway brushing. Post-haul maintenance is discussed in the next section below.

Table Transportation -2
Transportation Costs by Action Alternative

	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	<u>Mile</u>	<u>Cost MM\$</u>	<u>Mile</u>	<u>Cost MM\$</u>	<u>Mile</u>	<u>Cost MM\$</u>	<u>Mile</u>	<u>Cost MM\$</u>	<u>Mile</u>	<u>Cost MM\$</u>
System Roads	4.09	0.70	2.60	0.48	13.18	2.14	5.06	0.92	13.18	2.14
Temporary Roads	1.53	0.15	1.49	0.13	2.15	0.21	1.66	0.16	2.15	0.21
Reconstruction	3.64	0.18	4.40	0.22	7.52	0.49	3.23	0.11	7.52	0.49
Maintenance		0.08		0.08		0.12		0.08		0.12
Total Project Costs		1.11		0.91		2.96		1.27		2.96

Access Management

After the completion of harvest activities, roads are managed as necessary to control the type of use and kind of traffic. This is called access management. Road access is managed to prevent damage to the roadway, and to meet objectives for resources such as fish, water quality and wildlife, while maintaining public uses and access for timber management and related activities. The Thorne Bay Ranger District's access management program includes public and agency involvement, and interagency evaluation of road management objectives.

The following access management categories apply:

- **Encourage** - Motor vehicle use is encouraged by appropriate signing, public notification, and active maintenance of the road prism.
- **Accept** - Motor vehicle use is allowed but not encouraged, while the road is maintained for administrative access.
- **Discourage** - Motor vehicle use is discouraged by allowing alder growth at road entrance, nonremoval of blowdown, or road prism deterioration within acceptable environmental limits (depending on designated maintenance level). To discourage use, the road may also be signed as "Not Maintained for Motor Vehicle Traffic."
- **Eliminate** - Motor vehicle use is eliminated by physically blocking the road. Where prescribed for long-term intermittent roads, this strategy is achieved by placement of impassable barricades at road entrances. On short-term roads, removal of drainage structures effectively blocks vehicle traffic.
- **Prohibit** - Motor vehicle use is prohibited by a road order (CFR closure). Implementation of this strategy on remote road systems may require the installation of gates, in addition to public notification and appropriate signing.
- **Prohibit Seasonally** - Road is closed to motor vehicle use at times during the normal operating year. For all alternatives, seasonal prohibitions will be used as necessary to mitigate impacts to wildlife and subsistence resources (e.g., closure during either-sex deer hunting season). Administrative and permitted use of the roads will continue during closure periods, but only for specific permitted uses. Seasonal closures may be used in combination with cooperative efforts with fish and game protective agencies.

Specific post-harvest traffic strategies for access management are described here with regard to fisheries, wildlife, and recreation concerns. Access into newly entered drainages would be discouraged or eliminated to minimize resource impacts, unless there is an ongoing silvicultural need. In the latter case, other road uses would be less than the traffic of the harvest activity and would be incidental to the ongoing silvicultural activities. Roads are closed for several reasons, including fish and wildlife protection and lack of maintenance funding. Roads under Forest Service jurisdiction can be closed by regulation (36 CFR 36 212.7 and 261). Applicable law confers a statutory right of entrance to public lands to search for minerals, and access to mining claims (the Project Area has none at present) would not be restricted. However, miners and prospectors would be required to obtain a permit to use restricted roads.

The access management strategy proposed for the Luck Lake Project Area was developed with the following key points:

- Road use would in general be to "eliminate" rather than "prohibit" road use (see definitions above). Formal CFR road closures (prohibiting use) are not currently planned for any roads, but could be required in the future if use is detected.
- The access plan for the existing roads in the Project Area focuses primarily on reducing future road maintenance costs while keeping open those roads identified as

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key by the public in ongoing public involvement processes. The access plan also closes roads in key subsistence use areas.

- All newly-constructed roads would be closed. Those less than one mile in length would generally be placed in storage and all drainage structures would be removed. This equates to a Forest Practices Act (FPA) status of "closure." Roads longer than one mile would generally be placed in Maintenance Level 1. This equates to an FPA status of "inactive."

To meet access management objectives, all new roads built for timber harvesting would be closed after the completion of harvest activities. Depending on the alternative selected, 4.1 (Alternative 2), 2.6 (Alternative 3), 13.2 (Alternative 4), 5.1 (Alternative 5), or 13.2 (Alternative 6) miles of newly constructed roads would be closed. In addition, the 26.3 miles of road currently closed would remain so, and 19.6 miles of roads currently open would also be closed. Thus, 43.2 miles of forest system roads will remain open for public use after the completion of Luck Lake harvest activities, and the remaining existing and new roads will be closed. The draft access management plan proposed road closures are shown on the alternative maps.

Access management of existing roads is based on economic and resource concerns and comments received during scoping for the Luck Lake Project, and the Thorne Bay access management public involvement efforts. As an example, the existing 3030100 road that accesses Eagle Creek will remain open to immediately before the Eagle Creek bridge, with a gate placed at the bridge for safety, resource, and economic concerns.

Motorized road access to several areas within the Luck Lake Project Area would be eliminated due to the high cost of road maintenance and/or the sensitivity of fisheries, wildlife, and subsistence resources. Areas of primary concern include Baird Peak for subsistence uses, and the area southwest of Luck Lake for watershed and wildlife resources. Restrictions apply to all motorized vehicles, including passenger vehicles, four- and three-wheeled sport vehicles, and motorcycles. In some cases roads may be seasonally closed to reduce hunting and trapping pressure or during sensitive periods for wildlife (such as when they are nesting or denning).

In areas where long-term timber management is planned, some roads would be left open, primarily to provide for timber harvest, salvage, firewood, free use, and other management activities. As an example, roads near Coffman Cove in the vicinities of Dog Creek, Coffman Creek, and northwest of Luck Lake will remain open.

Efforts to minimize the visual impacts created by logging roads and landings are made during project planning. Where feasible, roads and landings with a visual quality objective of Modification will be located to minimize or eliminate their visibility.

Log Transfer Facilities

The log transfer facility (LTF) site at Thorne Bay could be used to implement any of the Luck Lake timber sales, and the LTF site at Coffman Cove might be available to implement these sales. The A-frame LTF's at Thorne Bay and Coffman Cove are being removed and cleaned up as part of the Ketchikan Pulp Company Long-term Contract Settlement Agreement. We anticipate that in the future, most logs will not be placed in the water at Thorne Bay but rather transported by methods such as barging. We also anticipate that the City of Coffman Cove may have a private LTF available at the Coffman Cove site in the future. Additionally, we expect that some logs will be transported to processing facilities on Prince of Wales Island and will not need to use LTF's.

The major potential impact involving LTF's is the accumulation of log debris in the marine environment. During the transfer of logs from land to water, bark would be sloughed off and could be deposited on the ocean bottom; bark also is continually sloughed off by agitation by wind and waves while logs are in rafts. Bark accumulation on the bottom can diminish

habitat for bottom-dwelling crustaceans and mollusks, as well as hamper underwater vegetation used as food and rearing sites for marine fish and other organisms. The discharge of bark into the water at a LTF is a discharge requiring a National Pollution Discharge Elimination System (NPDES) permit. The environmental effects from this timber entry will be limited to that allowed under the existing permits and their required monitoring. Which, if any, LTF is used will depend on the purchaser of individual timber sales, where they process the timber, and to whom they sell the wood.

Mitigation

Mitigation measures for forest resources applicable to road location, construction and/or design are specified on the unit and road cards (Appendices B and C). These follow the requirements of the Forest Plan, the Best Management Practices, and other direction. Many of these are discussed under the specific resource sections of this chapter.

A major consideration for roads is the need for construction timing restrictions to minimize potential effects to fish young and fry. The Thorne Bay Ranger District has developed several options to increase the length of the construction window, based on previous project experience. These include the installation of a log stringer bridge, which allows equipment to cross a creek without any instream construction; for small, non-fish bearing streams, damming and diverting water around the site during culvert placement and rocking; and installing culverts or bridges during low flow periods or when streams are frozen. District biologist's are consulted to determine appropriate options for each site.

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NOTES

Water

The following discussions and analysis are based on and summarized from the Soil, Floodplain, Riparian, and Wetland Resources Report for the Luck Lake Project (1998), and the Watershed Analysis for the Luck Lake Project Area (1998). These reports include more detailed analyses and references to the scientific literature. A Forest-wide treatment of water resources may be found in the Forest Plan FEIS, Chapter 3. Applicable water quality direction is included in the Forest Plan, Chapter 4 ("Riparian" and "Soil and Water") and Appendices C, D and J. The unit and road cards (Appendices B and C of this document) contain additional site-specific implementation requirements.

The water-related resources of the Luck Lake Project Area include floodplains, riparian areas (including streams, lakes and ponds), and wetlands. The effects of past timber harvest activities on the Luck Lake drainage is a project issue. Floodplains, and associated alluvial fans, are not proposed for timber harvest or road construction under any of the alternatives. Although past management activities occurred in these areas, current Forest Plan standards and guidelines prohibit timber harvest in active portions of either. It is also unlikely that future timber harvesting or roading would be proposed in floodplains or alluvial fans. Additional analysis relative to riparian areas may be found in the Fisheries section of this chapter.

Affected Environment

Riparian Areas

Riparian areas are areas adjacent to streams, lakes and ponds that are either influenced by groundwater from the water body, or are sites where ground disturbing activities can have a direct influence on the water quality of the water body. Riparian areas can include both upland and wetland areas adjacent to water bodies or streams. Riparian areas include floodplains and alluvial fans (discussed above), and areas below the slope-break on V-notch or gorge channels. Riparian area delineations can equate to stream buffers for a particular stream, but typically the stream buffer will be larger than the riparian area. In a few instances stream buffers may be smaller than the riparian area.

Stream process groups are groups of streams that share similar formative processes and stream channel characteristics. Process groups reflect the long-term interaction of geology, landform, climate, and riparian vegetation. The Riparian standards and guidelines in the Forest Plan are specific to stream process groups. Outside floodplains and alluvial fans, the majority of timber harvest within riparian areas of the Project Area has occurred in the high gradient contained process group (32 miles) and the moderate gradient/mixed control process group (6.3 miles). Almost 50 miles of streams in the Luck Lake Project Area have had past timber harvesting within their riparian areas, a total of 2,248 acres of harvest out of 6,857 acres of riparian area.

Wetlands

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater with a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions" (40 CFR 230.41 (a)(1)). "Frequency and duration" of a groundwater table sufficient to support a prevalence of hydrophytic plants can include areas where the groundwater table is 12 inches below the soil surface for as little as two weeks during the growing season. In the Luck Lake Project Area many wetlands are not associated with streams or lakes and include no surface water areas, while others are intimately associated with lakes or ponds. Some wetlands are dependant on ponds and lakes for recharge water, while some are not.

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Approximately 62 percent of the Luck Lake Project Area, 24,880 acres, is mapped as wetlands. Map interpretations include somewhat poorly drained soils on relatively steep slopes that do not always meet the hydrology criteria for classification as wetlands. Field reconnaissance indicates that this mapping probably overestimates the actual amount of forested wetlands on steeper slopes. Project Area-wide the most common wetland types are forested wetlands (8,577 acres), a forested wetland/non-wetland complex (4,814 acres), a forested wetland/short sedge complex (4,763 acres), and alpine shrub/short sedge (4,046 acres). Past timber harvest has occurred on 5,063 acres of wetlands in the Project Area, and there are currently 53 miles of roads across wetlands.

Forested wetlands on organic soils are very low-volume, low-productivity sites, but can support lower volume commercial timber. While forest regeneration is initially rapid on these sites, growth slows dramatically as the root systems of the young trees expand into saturated soils. The Record of Decision for the Forest Plan removed large areas of these soils from the tentatively suitable timber base until the results of a study of forest growth on these sites is completed. Approximately 5,349 acres of forested, poorly-drained organic soils occur in the Project Area, and approximately 1,299 acres have been harvested.

Wetland value (socioeconomic benefit) is largely dependant on the human use or perceived benefit to be derived from wetland functions (hydrologic, bio-chemical and biologic functions such as erosion control and sediment storage, element recycling and maintenance of water chemistry, and providing terrestrial and aquatic habitats). Three wetland habitat types in the Luck Lake Project Area possessing high wetland value are estuaries, tall sedge fens, and sphagnum bogs. All three types are locally scarce, totalling just 641 acres in the Project Area.

Estuaries are regionally highly important for their fisheries, wildlife and marine habitat values. Forest Plan standards and guidelines (Beach Fringe and Estuary) exclude commercial timber harvest within 1,000 feet of estuaries. Tall sedge fens filter large amounts of groundwater and are usually found on footslopes or adjacent to floodplains. Tall sedge fens are part of the floodplain process group and excluded from timber harvest by the Forest Plan standards and guidelines for riparian areas. Sphagnum bogs are very poorly drained organic soils derived from a relatively undecomposed accumulation of sphagnum moss.

Approximately 1/3-mile of road has been constructed across sphagnum bogs in the Project Area. Sphagnum bogs are not included in the suitable timber base, and no future road construction is planned in these areas.

Luck Lake Drainage

The Luck Lake drainage is comprised of three distinct watersheds: the East and West Forks of Luck Creek, and Luck Lake. The total size of the drainage is 19,300 acres, of which 12,193 acres are classified as wetlands. Past timber harvest activities have resulted in the following effects:

- The Luck Lake drainage has 34.1 miles of streams with past harvest in riparian areas; 21.3 are in the high gradient contained process group.
- The area contains 954 acres of floodplains, 686 of which (72 percent) have been harvested; these floodplains have 5.9 miles of roads.
- Timber harvest has occurred on 2,534 of the 12,193 acres of wetlands (21 percent); within these wetlands there are 28.4 miles of roads.

Environmental Consequences

Riparian Areas

Timber harvest and road construction activities can adversely impact riparian areas by destabilizing streambanks through vegetation removal, disturbing soils and causing erosion, and eliminating a source of large woody debris, thus reducing channel integrity. Timber harvest adjacent to riparian areas can also accelerate windthrow. Proposed harvest activities of the Luck lake Project are located predominantly at higher elevations away from fisheries resources, and most commonly adjacent to high gradient contained streams.

The Forest Plan standards and guidelines for riparian areas generally exclude timber harvest from the riparian areas along all Class I, II and III streams (all fish streams and non-fish streams with immediate influence on fish streams). Class IV streams (mainly ephemeral or intermittent channels) may be considered for timber harvest. Class IV streams within the Project Area occur in units receiving partial cut harvest prescriptions. Specific riparian area protection measures and application of Best Management Practices (BMP's) are documented on the road and unit cards (Appendices B and C), and in the soil and fisheries resource reconnaissance reports, contained in the project planning record.

The potential for windthrow of trees left within harvest units and riparian areas is addressed in the silvicultural prescriptions on unit cards. All units receive partial cut harvest, and it is anticipated that the residual trees left within harvest units will improve the windfirmness of trees left within riparian areas. Approximately 3,900 feet of riparian areas on high gradient contained streams lie within high wind disturbance probability areas (Krosse 1998); silvicultural prescriptions for these units emphasize leaving windfirm trees. Measures to reduce the risk of windthrow are not perfect, and it is estimated that up to 15 percent of the trees left on high gradient contained streams will incur some windthrow.

Wetlands

The high density of wetlands in the Luck Lake Project Area makes complete avoidance of wetlands impossible while implementing any of the action alternatives. During unit design all high-value wetlands (estuaries, tall sedge fens, and sphagnum bogs) were completely avoided. Proposed timber harvest on poorly-drained organic soils was evaluated on a case-by-case basis: all larger areas of poorly drained organic soils were removed from proposed timber harvest units; small inclusions were removed from harvest units if feasible.

Many of the remaining forested wetlands on organic soils do not support commercial or economic stands of timber. During Luck Lake Project reconnaissance, proposed timber harvest on poorly drained organic soils was investigated on a case-by-case basis. Large areas of poorly drained organic soils were removed from proposed timber harvest units. Small areas of poorly drained organic soils were considered on a case-by-case basis, and removed from harvest units where appropriate. Of the rest of the forested wetlands, up to 614 acres are considered for timber harvest in the alternatives. The amounts actually proposed for the action alternatives are displayed in Table Water-1. Harvesting timber from forested wetlands causes a temporary increase in soil moisture until equivalent transpiration and interception surfaces are reestablished. The partial cut harvest proposed for all units will keep some of the evapotranspiration surfaces intact. Tree growth on forested wetland sites is expected to be slower than on adjacent upland sites.

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Table Water-1

Proposed Timber Harvest and Road Construction in Wetlands by Alternative

Alternative	Timber Harvest (acres)	Road Construction	
		(miles)	(acres)
2	316	4.7	23
3	487	3.3	16
4	614	10.9	53
5	270	5.0	24
6	614	10.9	53

The frequency of wetlands within the Project Area also makes total avoidance of road construction in wetlands difficult or impossible. Table Water-1 displays the miles and acreages of wetland road construction by alternative. Roads through wetlands can affect the flow and reach of water in the wetland. The degree of impact depends largely on the wetland type and the road construction materials and methods. Placement of culverts and the use of coarse rock roads helps to maintain the flow and reach of water. Road location has avoided all high-value wetlands. For other wetlands, functional assessments were made on a case-by-case basis and the road located to minimize any adverse effects. The major factors considered in the functional assessments were water quality, fish or wildlife habitat, economic trade-offs, and locally scarce or unique features of the wetlands.

The road cards (in the project planning record) discuss specific wetland avoidance, minimization, and mitigation measures, as well as the wetland functions considered in the road location. Road closures will be used to limit vehicular access to administrative uses on new roads through wetlands. The new road construction proposed under the alternatives meets the silvicultural exemption requirements of the Corps of Engineers 404 (b) (1) permitting process.

Luck Lake Drainage

The floodplains of the Luck Lake drainage will not be affected, and riparian areas will be excluded from timber harvest under Forest Plan standards and guidelines. The Luck Lake drainage has the majority of the Project Area's high gradient contained streams, and blowdown could occur in about 15 percent of the riparian areas of these streams adjacent to harvest units (see previous discussion of riparian area effects). Timber harvest on forested wetlands in the Luck Lake drainage is proposed for all action alternatives, as is road construction. See Table Water-2. Alternatives 5 and 2 have the fewest acres of wetland harvest; Alternatives 3 and 2 the least road construction.

Table Water-2

Proposed Timber Harvest and Road Construction on Wetlands within the Luck Lake Drainage

Alternative	Timber Harvest (acres)	Road Construction (miles)
2	226	2.1
3	344	1.5
4	364	4.2
5	157	2.6
6	364	4.2

Cumulative Effects

Riparian Areas

Past timber harvest activities have included harvest below the slope-break on high-gradient contained streams. This harvest has resulted in soil disturbance on the steep sides of V-notches, a lack of large woody debris in the streams, and an increase in sediment reaching downstream resources. These effects have occurred primarily in the Chum Creek and Luck Lake watersheds. More recent timber harvest has left standing timber below the slope-break. Most of these slope-break buffers remain standing, but at least one in the southwest fork of Luck Creek watershed has mostly blown down, disturbing soils on the side of the V-notch and causing many trees to bridge the notch.

Timber harvest proposed under the five action alternatives will leave trees standing below the slope-break on streams within V-notches. To reduce the chance of windthrow, a variety of silvicultural prescriptions are used for stands adjacent to V-notches to better achieve windfirmness of the remaining trees. Partial cut prescriptions will provide additional windfirmness. However, some windthrow is still likely within some of the riparian areas associated with the high-gradient contained streams. For estimating cumulative effects, it is assumed that all remaining suitable timber lands will be harvested by 2054, and that during that time our understanding of how to provide reasonable assurance of windfirmness will improve. It is anticipated that blow down will occur in about five percent of riparian forests adjacent to high gradient contained streams in the future, or along about 1.5 miles of streams.

Wetlands

To estimate cumulative effects of timber harvest and associated roads on wetlands, the same assumption of harvest by 2054 is used. The effects of timber harvest on the beneficial functions of forested wetlands are in most cases expected to be temporary, especially with the use of partial cut timber harvest. The amount of road needed to access the remaining tentatively suitable forest land is estimated by extrapolating from the roads required for Alternatives 4 and 6, which have the highest proposed harvest. Currently there are about 53 miles of roads across wetlands, and the Luck Lake Project could bring that total up to 64 miles (under Alternatives 4 and 6). Harvesting the remaining suitable lands would require another 30 miles of roads in wetlands, for a cumulative total of about 94 miles - one mile of road for every 265 acres of wetlands. The effects of road construction on wetland resources is discussed above. The cumulative effect of converting a portion of the wetlands within a watershed to roads is largely unknown.

Luck Lake Drainage

Under the assumption that all suitable timber lands will be harvested by 2054, and roads built to access harvest units, the Luck Lake drainage could have riparian area blowdown on about

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1.1 miles of high gradient contained streams, and would have a total of 41 miles of roads across wetlands - one mile of road for every 300 acres of wetlands.

Mitigation

Water-related (including riparian areas and wetlands) resource protection prescriptions and applicable BMP's are listed on unit and road cards, and in the fisheries and soil resources reconnaissance reports (all contained in the project planning record). The Beach and Estuary Fringe, Riparian, Soil and Water, and Wetlands standards and guidelines of the Forest Plan all apply. The Region 10 Soil and Water Conservation Handbook includes all BMP's applicable in Alaska and provides additional direction for project implementation.

Wildlife

The following discussions and analyses are based on the Luck Lake Wildlife Resources Report for the Luck Lake Project Area (1998) which includes the Biological Assessment and Evaluation for the Project Area (see Threatened, Endangered and Sensitive Species), and a more detailed treatment referenced to the scientific literature. A related wildlife analysis is contained in the Forest Plan FEIS, Chapter 3 and Appendix N. Applicable wildlife direction is included in the Forest Plan, Chapters 3 (Land Use Designations) and 4 (Forest-wide Standards and Guidelines) and Appendix K. The unit and road cards (Appendices B and C of this document) for the Luck Lake Project contain additional site-specific implementation requirements.

Affected Environment

The Luck Lake Project Area is a mosaic of old-growth stands, young growth stands, muskegs, and recent clearcuts all containing variable timber densities. Timber harvest began in the 1950's, and there has been little or no retention of overstory structure within the almost 10,000 acres harvested to date. Extensive harvest below 1,200-ft. elevation occurred in Eagle Creek, Luck Creek, and Coffman Creek watersheds in the 1970's. Approximately 33 percent of each of these watersheds has been harvested. These productive, young stands are in the stem exclusion stage of forest regeneration which will last approximately 80 years (Alaback 1982). They are densely stocked, uniform in size, and exhibit a poorly developed understory and an even-aged overstory that provides low diversity and low habitat value for wildlife. The distribution of closed-canopy, young-growth stands currently impedes elevational migration of deer at midslope, and has significantly reduced deer winter range in the Project Area.

There are three "small" old-growth habitat reserves (Old-growth Habitat Land Use Designation) in the Project Area, one in each value comparison unit (VCU). The location and landscape function of these reserves was evaluated during several interagency and interdisciplinary meetings during 1997 and 1998. Changes to two of the small old-growth habitat reserves are proposed to include more low-elevation wildlife habitat than was in the original designations. As discussed below, lower-elevation old-growth forest is particularly important as deer winter habitat. Specifics on the small reserves are discussed in the Biodiversity and Old Growth section of this chapter.

Management Indicator Species (MIS)

Management Indicator Species (MIS) are species of vertebrates and invertebrates whose population changes are believed to best indicate the effects of land management activities (USDA Forest Service 1982). MIS are used to assess maintenance of population viability (the ability of a population to sustain itself naturally), biological diversity, and management of game (Forest Plan FEIS 1997).

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The following have been selected as MIS for this project and will be discussed in this chapter:

Species	Basis for Selection
Sitka black-tailed deer	Important subsistence, game species
marten	Old-growth habitat; important furbearer
hairy woodpecker	Cavity excavator
brown creeper	High-volume stands; Large, old-growth trees
Vancouver Canada goose	Wetland habitat; game species
Alexander Archipelago wolf	Species of concern; furbearer
Prince of Wales flying squirrel	Endemic taxon; old-growth associate

Sitka Black-tailed Deer

The Sitka black-tailed deer was chosen as an MIS because it is an important game and subsistence species and is seasonally associated with old-growth forests. Research conducted in Southeast Alaska indicates that high-volume, mature forests at lower elevations are needed to sustain deer populations during severe winters (Schoen et al. 1985; Hanley and Rose 1987; Yeo and Peek 1992). (The Forest Plan divides productive old growth into three volume classes: high, medium, and low. These are defined and discussed on pages 3-19 of the Forest Plan FEIS.) Large, strong branches of mature stands intercept snow and maintain available forage. Productive, higher volume stands of old-growth forests support the largest biomass of herb and shrub forage (Alaback 1982). Deer populations are impacted by the combination of deep-snow winters and large amounts of winter range converted to second growth. Snow reduces or eliminates forage availability in young clearcuts. Closed canopy young-growth stands provide little forage in all seasons.

The Project Area has been divided into high-, medium-, and low-value deer winter range. Low elevation (<800 ft.) habitat (the high-value habitat) has been significantly reduced within the Project Area (Table Wildlife-1). Maintaining low elevation habitat was the main reason for the changes to small old-growth habitat reserves.

Table Wildlife-1
Existing Harvest by Elevation Class

Elevation Class	Acres Harvested	Acres Remaining (1998)*
0-800	7,834	7,434
800-1,200	1,603	2,733
1,200-1,500	398	2,185
>1,500	103	2,143

*Unharvested productive old growth
Source: GIS Database

An interagency model (Suring et al. 1992) was developed to evaluate the potential quality of winter habitat for Sitka black-tailed deer. The model was updated for the Forest Plan revision. Further updates specific to this Project Area include the following: 1) 100 deer/square mile was used as the multiplier; 2) predation; 3) the forest suitability layer has

been updated to reflect field-verified suitability. Model outputs are expressed as numbers of individuals a habitat is theoretically capable of supporting; they do not represent individuals actually present.

Prior to large-scale timber harvesting (that is, in 1954), the Luck Lake Project Area had a habitat capability of 1,061 deer. At the present time (1998) the capability is 633 deer. Habitat capability for deer has thus declined to 60 percent of the pre-timber harvest capability. The Luck Lake Project Area generally corresponds to Wildlife Analysis Area (WAA) 1420. Deer habitat capability is estimated by WAA in the Forest Plan FEIS (pp. 3-365 to 3-379). WAA 1420 has had the greatest decline in deer habitat capability (55 percent of the 1954 capability remaining) of any WAA within the Tongass.

Marten

The marten was selected as an MIS because of its association old-growth and it is an important furbearer. According to reports from Alaska Department of Fish and Game, marten populations are considered moderate in the Project Area (Larson pers. comm.). The Forest Plan identifies high-value marten habitat as high-volume, old-growth forest below 1,500 ft. elevation. It is likely that the majority of past timber harvest in the Project Area was of high-volume stands, but the actual amount is not known. The Project Area currently contains 5,588 acres of old-growth forest meeting the criteria for high-value marten habitat.

Martens are easily trapped and can be over-harvested, especially where trapping pressure is heavy and not effectively controlled. This corresponds closely to the availability of road access. Marten densities decrease (due to their susceptibility to over-trapping) when road densities exceed 0.2 miles of road per square mile, and marten densities will be reduced by as much as 90 percent when road densities approach 0.6 miles of road per square mile. Open road density in the Project Area is currently 1.2 miles of road per square mile.

Hairy Woodpecker

The hairy woodpecker was chosen as an MIS because of its preference for stands of older western hemlock and Sitka spruce, and for its association with snags (standing dead trees). Hairy woodpeckers are resident birds in Southeast Alaska and use snags and partially dead trees for nesting and foraging. The hairy woodpecker is a primary cavity excavator. Forty-two species of mammals and birds in Southeast Alaska nest or den in tree cavities, including woodpeckers, owls, hawks, waterfowl, bats, squirrels, martens, and otters. For nest and den sites several of these species depend exclusively on cavities in the large diameter snags characteristic of old-growth stands. Most cavity nesting or denning species can be represented by hairy woodpeckers as they would respond similarly to proposed activities.

Hairy woodpecker habitat is defined as high-volume stands below the subalpine category. Availability of suitable winter habitat for roosting and foraging is considered an important constraint on the habitat suitability of the hairy woodpecker.

Brown Creeper

The brown creeper was chosen as an MIS because it is associated with large, old trees. Large diameter trees are preferred because a bird can feed longer on a large tree and capture more prey per visit. Stands with volumes of 20,000-30,000 board ft. per acre contained approximately one tenth the number of brown creepers observed in stands with volumes greater than 30,000 board feet per acre (Hughes 1985). Other habitats in Southeast Alaska are not considered to suitable for brown creepers.

Vancouver Canada Goose

The Vancouver Canada goose was selected as an MIS to represent old-growth and riparian habitats. The Vancouver Canada goose is also a game species. Vancouver Canada geese are primarily nonmigratory (Ratti and Timm 1979) and are found almost exclusively in Southeast Alaska. Unlike other subspecies of Canada Geese, Vancouvers use forested habitats for

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nesting, brood rearing, and molting; they use trees for nest sites and perches during incubation, and rely primarily on forest understory plant species for food (Doyle et al. 1988).

Gray (Alexander Archipelago) Wolf

The Alexander Archipelago wolf is a subspecies of the gray wolf. It was selected as an MIS because it is a species of concern and an important furbearer. The Alexander Archipelago wolf has been the subject of Endangered Species Act deliberations for several years. In 1997, after a petition for listing, a “non-warranted” decision, an appeal, and a court-ordered reevaluation, the U.S. Fish and Wildlife Service made a second determination that the species in Southeast Alaska did not warrant listing.

The primary food of most Southeast Alaskan wolves is deer, although they feed on beaver and spawning salmon when available (Wood 1990, Person 1993). Deer habitat capability is believed to be the single most important factor affecting wolves. Two important issues exist for wolves: 1) a short-term concern involving the amount of trapping and hunting of wolves, and 2) a long-term concern involving reductions in deer habitat capability. Levels of wolf harvest on north Prince of Wales Island are of particular concern where the numbers killed have exceeded 50 percent of the population. Deer habitat capability of the Project Area is currently about 12 deer per square mile.

Many studies have shown that wolf abundance may be inversely correlated with road density (Theil 1985, Jensen et al. 1986, Mech et al. 1988, Fuller 1989, Person et al. 1996). Person et al. (1996) noted that wolf harvest rates increased sharply in WAA's on Prince of Wales Island where road density exceeded 0.49 miles per square mile. The Forest Plan recommends maintaining open road densities at or below a threshold of 0.7 to 1.0 mile/square mile to help protect wolf populations from over-harvest. High road densities allow human access for shooting or trapping wolves, and management of roads is an important component of a wolf conservation strategy (Van Ballenberghe et al. 1975, Mech and Karns 1977). Open road density in the Project Area is currently 1.2 miles per square mile.

Prince of Wales Flying Squirrel

The Prince of Wales flying squirrel is associated with old-growth forest and may be genetically distinguished from all other flying squirrel populations. Landscape connectivity is an important factor for flying squirrel viability because this species exhibits limited mobility. The Prince of Wales flying squirrel was part of a group of endemic mammals evaluated for potential risks to viability in the Forest Plan FEIS. Among the endemics, it was rated highest as being at risk of not having viable populations maintained over time, largely due to its dependence on unfragmented old-growth forest (Forest Plan, pp. 3-410 to 3-415).

Environmental Consequences

Effects on Wildlife Habitat

The amount of timber harvest among the action alternatives ranges from 431 acres (Alternative 5) to 1,048 acres (Alternatives 4 and 6). This is three to seven percent of the remaining productive old-growth forest in the Project Area (see Table Wildlife-1). All harvest units in VCU's 572 and 581 are designed to retain approximately 30 percent canopy closure consistent with the goshawk standards and guidelines (discussed in the Threatened, Endangered and Sensitive Species section of this chapter). These VCU's have had more than 33 percent of their productive old growth harvested and thus pose a higher risk of not providing habitat to sustain viable populations of goshawks. Standards and guidelines for marten have similar harvest objectives. Harvest objectives for goshawk and marten (Forest Plan, pp. 4-90 to 4-91 and pp. 4-118 to 4-119) include the following:

- An average of 30 percent canopy closure throughout the timber harvest unit.

- An average of at least 8 large trees/acre .
- An average of at least 3 large decadent trees/acre.
- Remaining trees should be uniformly distributed throughout the stand, but trees may be clumped for operational concerns or ecological opportunities.
- Retained trees should have a reasonable assurance of windfirmness.

Compared to traditional clearcut harvest, these partial harvest requirements will mitigate some effects to old-growth associated species in that some forest canopy is provided along with large living and decadent (snag) trees. They will not mitigate effects to species preferring a more closed, unfragmented habitat. Alternatives 4 and 6 include five harvest units in VCU 582, which is not under the goshawk or marten requirements. These units have either a partial cut or clearcut with reserve prescription, and would retain fewer features benefitting wildlife.

Although each action alternative includes harvest of forested wildlife habitat, as displayed in Table Wildlife-2, some key habitats are protected by Forest Plan standards and guidelines. These include most riparian management areas (the exception being along Class IV streams), and all beach fringe and estuary fringe habitats. Each VCU contains one small old-growth habitat reserve, setting aside productive old-growth forest, much at lower elevations (see Biodiversity and Old Growth).

Table Wildlife-2
Direct Effects on Wildlife Habitats (Acres Harvested)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Productive Old Growth (POG)	0	464	857	1,048	431	1,048
High-volume POG	0	191	529	597	201	597
Forested wetland	0	316	487	614	270	614

Source: GIS Database

Alternative 1, the no-action alternative, proposes no timber harvest and thus has no effect on existing habitat. Among the action alternatives, Alternatives 2 and 5 harvest roughly the same amount in each category; Alternative 2 has a slightly higher total harvest, and harvests more in forested wetlands, than Alternative 5, but is slightly lower in harvest of high-volume stands. Alternatives 3, 4, and 6 are also comparable in harvesting higher amounts in each category, although the differences between them are more noticeable, and Alternatives 4 and 6 are highest in all three categories. In addition, the total harvest of Alternatives 3, 4, and 6 includes a greater proportion of high-volume productive old growth (roughly 57 percent of total harvest) than in Alternatives 2 and 5 (41 and 47 percent, respectively).

The amount of harvest at the lower elevations is also an important consideration, especially for Sitka black-tailed deer and other species needing habitat cover during the winter. Table Wildlife-3 displays harvest by alternative for four elevational bands. Alternative 2 harvests the fewest low-elevation acres, followed by Alternatives 5, 3, and 4.

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Table Wildlife-3
Harvest Within Elevational Bands (Acres)

Elevation (feet)	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
0-800	0	75	162	188	105	188
800-1,200	0	196	378	465	272	465
1,200-1,500	0	102	170	221	30	221
>1,500	0	54	111	122	15	122

Source: GIS Database

Effects on MIS

The previous section discusses changes to wildlife habitats used by Project Area species, including management indicator species. This section discusses how those changes affect the potential habitat capability for each MIS.

Sitka Black-tailed Deer

As noted previously, the deer model estimates the capability of habitats to support deer and does not reflect actual populations in the Project Area. Model outputs are more useful for comparing relative changes by alternative than indicating actual effects to wildlife species. Results of the Tongass National Forest deer model are displayed in Table Wildlife-4. Deer habitat capability of the Project Area has declined by 40 percent since timber harvest began in the 1950's. The Luck Lake alternatives would add another two to six percent to that decline; the effect is smallest in Alternative 2, greatest in Alternatives 4 and 6.

Table Wildlife-4
Habitat Capability Changes for Sitka Black-tailed Deer

1954	1998	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
1061	633	618	603	596	612	596

Marten

Timber harvest units in the action alternatives will retain overstory structure consistent with marten standards and guidelines, except for the five units in VCU 582 in Alternatives 4 and 6. The partial cut treatments retain 30 percent canopy closure. Units which fall into the high-volume strata and below 1,500 feet elevation are considered high-value marten habitat. Even with partial cut harvest, these units will fall out of the high-value habitat component since they are no longer high-volume stands. Thus any timber harvest in high-value marten habitat will reduce that habitat accordingly. The amount of timber harvest in high-value marten habitat is greatest under Alternatives 4 and 6 (508 acres), which represents a 9 percent reduction in high-value marten habitat within the Project Area. The other action alternatives range from 165 acres (3 percent) in Alternative 2 to 447 acres (8 percent) in Alternative 3 of potential harvest.

Road construction by alternative is described in the Transportation section. The access and travel management plan has been designed to reduce open-road density in the Project Area in all action alternatives. After project completion and implementation of the access

management plan, the open road density of the Project Area will be reduced from the current 1.2 miles per square mile to 0.8 mile per square mile. This is still at a level estimated to have substantial effects on marten populations by providing access for trapping (Strickland et al. 1982).

Hairy Woodpecker

All planned harvest units in VCU's 572 and 581 will retain at least three snags per acre to meet marten and goshawk standards and guidelines. Future snag recruitment will be provided through 30 percent canopy retention in these same units. Under Alternatives 4 and 6, several units will be harvested in VCU 582 (which has had no harvest to date), and although these will be partial cuts or clearcuts with reserves, they have no specific requirements for snag retention or canopy closure. Based on this information, snag habitat for hairy woodpeckers and other snag-dependant species will be maintained throughout the Project Area, but less so under Alternatives 4 and 6.

Brown Creeper

The brown creeper prefers large-diameter, old-growth trees. Brown creeper habitat can be expected to decline approximately proportional to the amount of old-growth forest harvested by alternative, although somewhat more in Alternatives 3, 4, and 6, which harvest a higher proportion of high-volume old growth (Table Wildlife-2). The 30 percent canopy closure requirement will help mitigate loss of habitat. After harvest, at least 13,400 acres of unharvested productive old-growth forest will remain in the Project Area.

Vancouver Canada Goose

None of the alternatives harvest timber in riparian areas along streams and around lakes, or in the beach and estuary fringes. Forest-wide standards and guidelines for waterfowl management include providing a minimum distance of 330 feet between human activities and significant waterfowl areas, including important nesting habitats. These requirements, combined with the beach and estuary buffers, will protect significant waterfowl areas.

Harvest on wetlands will reduce potential waterfowl habitat outside the above areas. As shown in Table Wildlife-2, all alternatives harvest some forested wetlands. Alternatives 5 and 2 harvest the least (270 and 316 acres), Alternatives 3 is next (487 acres), and Alternative 4 and 6 harvest the most forested wetlands (614 acres).

Alexander Archipelago Wolf

Since deer are the primary prey species of wolves in the Project Area, wolf habitat capability is predicted to be reduced in proportion to the reduction in deer habitat capability. Implementing any of the action alternatives will result in a reduction in deer habitat capability, as is shown in Table Wildlife-4. The reduction was estimated to be from one to three percent of the 1954 deer habitat capability.

Most effects on wolves in the Project Area are the result of past activities. The current estimated deer habitat capability (633 deer, see Table Wildlife-4) equates to an average of slightly less than 12 deer per square mile. Forest Plan standards and guidelines for Alexander Archipelago wolf state that 13 deer per square mile is to be generally considered the minimum deer density to support wolves in biogeographic provinces where deer are their primary prey (Forest Plan, p. 4-116). To maintain a density of 13 deer per square mile, it is estimated that a habitat capability of 17 deer per square mile should be maintained (Person 1997, as cited in TPIT 1998). Under the action alternatives, deer per square mile habitat capability drops to about 11 (slightly above or below, depending on alternative).

Deer habitat capability was estimated for all wildlife analysis areas on the Tongass in the Forest Plan FEIS. Mean habitat capability for nine wildlife analysis areas in north-central Prince of Wales Island is 14 deer per square mile (Forest Plan FEIS, Table

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3-112). None of the proposed alternatives are expected to significantly change this number.

The access and travel management plan has been designed to reduce current open-road density in all action alternatives. After project implementation is complete, the current density of 1.2 miles of road per square mile will drop to 0.8 miles per square mile. This is within the Forest Plan standards and guidelines for wolf, which recommend an open road density of or less than 0.7 to 1.0. Road closure methods (see Transportation section) are prescribed for each road in the Project Area. Closures will reduce the potential wolf harvest; however, closed roads provide walking corridors for hunters who may harvest wolves incidentally while hunting other game species.

Prince of Wales Flying Squirrel

The multiscale old-growth habitat reserve strategy of the Forest Plan was designed to meet the habitat needs of old-growth associated species, including the flying squirrel. For the action alternatives of the Luck Lake Project, old-growth habitat reserves were designed to include more low elevation forest. Prior harvest of riparian corridors in the Project Area has limited connectivity of the forested landscape. Partial cut prescriptions have been designed for all of the action alternatives. Maintaining forest structure components within the harvest units may increase the value of the habitat for flying squirrels above clearcutting.

Flying squirrel habitat can be expected to decline in approximately the same proportion as the amount of old-growth forest harvested by alternative. Alternatives which increase forest fragmentation at the landscape level will reduce the value of residual patches of old-growth forest. This process (forest fragmentation) may lead to displacement of local populations because stands of sufficient size to support a population are not maintained, and suitable habitat is not maintained between stands to allow for juvenile dispersal and population interchange. Alternative 1 will maintain habitat in its current condition, as will the three Project Area small old-growth habitat reserves. Alternative 2 emphasizes maintaining low elevation habitat and low elevation connectivity; it has the fewest low-elevation harvest acres, and least harvest of high-volume stands, of the action alternatives. Alternative 5 is fairly comparable to Alternative 2 in this regard; Alternatives 3, 4, and 6 harvest considerably more of these types of habitats.

Cumulative Effects

Table Wildlife-5 shows the cumulative effects on forest habitat assuming all currently unharvested suitable timber lands (3,800 acres) are harvested over the next five decades. Total productive old-growth forest remaining would be approximately 10,740 acres. This would consist primarily of the old growth within the three small old-growth habitat reserves, old-growth forest within riparian areas and the beach fringe, and other areas of productive old growth considered unsuitable for timber management. This is 44 percent of the productive old-growth forest originally in the Project Area (prior to 1954).

Table Wildlife-5
Cumulative Effects to Wildlife: Habitat Components in 2054

Year	Productive Old Growth (POG) (acres)	High- Volume POG (acres)	Low- Elevation POG (acres)	Deer Habitat Capability (# of Deer)	Open Road Density (miles per sq. mi.)
1954	24,478	16,634*	15,265	1,061	0.0
2054	10,740	4,884	5,939	441	0.8

* assumes prior harvest occurred in high-volume strata

Important high-volume old-growth habitat would total almost 4,900 acres, and productive old growth at lower elevations (from 0 to 1,200 feet) would total about 5,900 acres. About 2,830 acres of this low-elevation old growth would be high-volume old growth.

With the three old-growth habitat reserves and the amount of low-elevation habitat remaining, habitat capability for deer would decline to 441, a reduction of 30 percent from the current level and a cumulative reduction of 58 percent from the 1954 condition. This would provide a deer density of about 8 deer per square mile, well below the 13 per square mile level recommended as the minimum for providing prey for wolves.

With implementation of the access management plan, open road density would remain at the level projected for the close of the Luck Lake Project, 0.8 miles of road per square mile.

Mitigation

The primary wildlife direction is included in the Forest Plan, Chapters 3 (Land Use Designations, including Old-growth Habitat) and 4 (the Forest-wide standards and guidelines), and Appendix K. The unit and road cards (Appendices A and B of this document) for the Luck Lake Project contain additional site-specific implementation requirements. After project completion, all new project roads and many others in the area will be closed. Two of the Project Area's three small old-growth habitat reserves were relocated or redesigned to include more low elevation habitat for deer (see Biodiversity and Old Growth).

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NOTES

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B.S., Natural Resource Planning, Humboldt State University 1988.

Forest Service: 8 years

GIS Analyst, Tongass NF, Thorne Bay RD, 3 years

Forestry Technician, Tongass NF, Thorne Bay RD, 5 years

Jim Beard, Fish Biologist

Education

53 units, Fisheries major, California State University-Humboldt

14 units, Biology major, Monterey Peninsula Junior College

40 units, Zoology major, California State University-Long Beach

28 units, Biology major, California State College-Dominguez Hills

A.A., Biology, Los Angeles Harbor Junior College, 1976

Forest Service: 12 years

Fisheries Biologist, Tongass NF, Thorne Bay RD, 6 years

Fish and Wildlife Staff Officer, Tongass NF, Thorne Bay RD, 4 months

Fisheries Biologist, Mount Hood NF, Clackamas RD, 1.3 years

Biological Technician-Fisheries, PSW Forest & Range Exp. Station, Arcata, 1.5 years

Biological Technician-Fisheries, El Dorado NF, Placerville SO, 7 months

Forestry Technician, Angeles NF, Arroyo Seco RD, 5 seasons

Forestry Aid, Los Padres NF, Santa Barbara RD, 1 season

Other Relevant Experience

Marine Biologist, Sea Education Afloat, California, 9 months

Fisheries Technician, Pacific Marine Fisheries Commission, California, 5 years

Biological Technician-Fisheries, USFWS, Colorado River Fish Project

Marine Fisheries Interviewer, KCA Research, California, 1 year

Eric L. Johansen, Fish Biologist

Education

B.S., Fisheries Science, University of Alaska-Fairbanks, 1990

Forest Service: 7.5 years

Fisheries Biologist, Chugach NF, Seward RD, 7 months

Fisheries Biologist, Tongass NF, Thorne Bay RD, 7 years

Other Relevant Experience

Fisheries Technician III, Alaska Dept. of Fish & Game, 5 seasons

Cheri Ford, Wildlife Biologist

Education

B.S., Wildlife Biology, University of Montana, 1988

B.S., Forestry, University of Montana, 1990

Forest Service: 10 years

Wildlife Biologist, Tongass NF, Thorne Bay RD, 4 years

Fish and Wildlife Staff Officer, Tongass NF, Thorne Bay RD, 3 years

Wildlife Biologist, Bitterroot NF, Stevensville RD, 1 year

Wildlife Biologist, Lolo NF, SO, 1 year

Soils Co-Op, Bitterroot NF, Sula RD, 1 season

Amy Lee Russell, Wildlife Biologist

Education

B.S., Forest Wildlife Management, Stephen F. Austin State University, 1992

Forest Service: 5 years

Wildlife Biologist, Tongass NF, Thorne Bay RD, 5 years

James F. Baichtal, Geologist

Education

Associate Science Degree, LCC, Longview, WA, 1977

B.S. in Geology, Washington State University, 1980

M.S. in Geology, Washington State University, 1982

Forest Service: 13 years

Forest Geologist, Tongass NF, Ketchikan Area, 7 years

Resource Geologist, Umpqua NF, Roseburg, OR, 2.5 years

Engineering Geologist, Ochoco NF, Prineville, OR, 3.5 years

Other Relevant Experience

Engineering Geologist, U.S. Army Corps of Engineers, Ft. Worth, TX, 1.5 years

Instructor, Geology Field Camp for Paleontology Lab, Washington State University,

2 summers, 1978/79
Operated a Geologic consulting business, Roseburg, OR

Robert W. Wetherell, Landscape Architect

Education

B.L.A. Landscape Architecture, University of Georgia, 1985

Forest Service: 11 years

Landscape Architect, Tongass NF, Thorne Bay RD, 10 years

Landscape Architect, Chugach NF Supervisors Office, 1 year

Terry Fifield, Archeologist

Education

B.S., Geology, Sunny College at Cortland, 1978

M.S., Anthropology, Eastern New Mexico University-Portales, 1987

Forest Service: 7 years

Zone Archaeologist, Tongass NF, Craig/Thorne Bay RD's, 3 years

District Archaeologist, Ochoco NF, Burns, OR, 2 years

Archaeologist, Tongass NF, Ketchikan Area, 2 years

Other Relevant Experience

Archaeologist Crew Chief, USDI National Park Service, Anchorage, AK, 1 year

Archaeologist, Bureau of Indian Affairs, Anchorage, AK, 2 years

Archaeologist, Eastern New Mexico University, 5 years intern

Archaeologist Technician, BIA, Anchorage, AK, 2 years

Archaeologist, BLM, Albuquerque, NM, 1 year

Patrick Tierney, Silviculturist

Education

10 Credits, Various Short Courses, Technical Sessions and Workshops, USDA Forest Service and Society of American Foresters, 1980 to Present

4 Credits, Stand Dynamics, USDA Forest Service and University of Washington, 1995

4 Credits, Managing Forest Structure, Oregon State University, 1989

24 Credits, Silviculture Institute, Oregon State University and University of Washington, 1988

B.S., Natural Resource Management/Forestry, Cook College, Rutgers University, 1978

Forest Service: 19 years

Certified Silviculturist, Tongass NF, Thorne Bay RD, 8 years

Assistant Silviculturist, Tongass NF, Thorne Bay RD, 5 years

Lands, Minerals, and Special Use Forester, Toiyabe NF, Austin RD, 3 years

Assistant Cadastral Surveyor, Toiyabe NF, 3 years

Other Relevant Experience

Planning and Zoning Commission, City of Thorne Bay, Alaska, 11 years

Platting Board, City of Thorne Bay, Alaska, 11 years

Coastal Management Review Board, City of Thorne Bay, Alaska, 7 years

James D. Rhodes, Civil Engineer

Education

Forest Engineering Institute IV, Oregon State University, 1975

B.S., Civil Engineering, St. Martin's College, 1967

Forest Service: 27 years

Transportation Planner, Tongass NF, Ketchikan Area, 18 years

Project Engineer, Tongass NF, Ketchikan Area, 2 years

Preconstruction Engineer, Tongass NF, Ketchikan Area, 2.5 years

Design Engineer, Gifford Pinchot NF, Engineering Zone 3, 2 years

Construction Engineer, Gifford Pinchot NF, Engineering Zone 1, 2.5 years

4 Lists

Other Relevant Experience

U.S. Army Corps of Engineers, 3 years

Additional Support

Chris Minnillo - Writer/Editor

Bruce Rene - Writer/Editor

Peggy Woodworth - Lands/Permits

Eric Johnson - Field Recon., Streams & Watershed Analysis

Thomas Belfield - Field Recon., Botany

Glossary

Access

The opportunity to approach, enter, and make use of public lands.

Access Management

Acquiring rights and developing and maintaining facilities needed by people to get to and move through public lands (physical attributes).

Active Channel

Unstable portion of a stream where stream channels are frequently changing course.

Adfluvial Fish

Species of populations of fish that do not go to sea, but live in lakes, and enter streams to spawn.

Aerial Harvest Systems

Harvesting methods in which the cut logs are moved from the stump to the loading area or log deck without touching the ground, for example helicopter logging.

Alaska National Interest Lands Conservation Act (ANILCA)

Passed by Congress in 1980, this legislation designated 14 National Forest wilderness areas in Southeast Alaska. The Alaska National Interest Lands Conservation Act of December 2, 1980. Public Law 96-487, 96th Congress, 94 Stat. 2371-2551. In Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

Alaska Native Claims Settlement Act (ANCSA)

Public Law 92-203, 92nd Congress, 85 Stat. 2371-2551. Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

Alluvial Fan

A cone-shaped deposit of organic and mineral material made by a stream where it runs out onto a level plain or meets a slower stream.

Alpine

Parts of mountains above tree growth and/or the organisms living there.

Alternative

One of several policies, plans, or projects proposed for decision making.

Anadromous Fish

Anadromous fish (such as salmon, steelhead, and sea-run cutthroat trout) spend part of their lives in freshwater and part of their lives in saltwater.

Anadromous Species

One whose individuals are born in freshwater but migrate to and feed in the sea before returning to freshwater to breed.

Background

The distant part of a landscape. The seen or viewed area located from three or five miles to infinity from the viewer. (See "Foreground" and "Middleground".)

Bedload

Sand, silt, and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water.

Best Management Practice (BMP)

Practices used for the protection of water quality. BMP's are designed to prevent or reduce the amount of pollution from nonpoint sources or other adverse water quality impacts while meeting other goals and objectives. BMP's are standards to be achieved, not detailed or site specific prescriptions or solutions. BMP's as defined in the USDA Forest Service Soil & Water Conservation Handbook are mandated for use in Region 10 under the Tongass Timber Reform Act.

Biological Diversity (Biodiversity)

The variety of life in all its forms and at all levels. This includes the various kinds and combinations of: genes; species of plants, animals, and microorganisms; populations; communities; and ecosystems. It also includes the physical and ecological processes that allow all levels to interact and survive. The most familiar level of biological diversity is the species level, which is the number and abundance of plants, animals, and microorganisms.

Biological Potential

The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.

Blowdown

See windthrow.

Board Foot (BF)

A unit of wood 12" X 12" X 1". One acre of commercial timber in Southeast Alaska on the average yields 28,000-34,000 board feet per acre (ranging from 8,000-90,000 board feet per acre). One million board feet (MMBF) would be the volume of wood covering one acre two feet thick. One million board feet yields approximately enough timber to build 120 houses or 75,555 pounds of dissolving pulp.

Bole

Trunk of the tree.

Braided Streams or Channels

A stream flowing in several dividing and reuniting channels resembling the strands of a braid, the cause of division being the obstruction by sediment deposited by the stream.

Brush Disposal

Cleanup and disposal of slash and other hazardous fuels within the forest or project areas.

Buffer

An area around a resource where timber harvest is restricted or prohibited. For example, the Tongass Timber Reform Act (TTRA) requires that timber harvest be prohibited in an area no less than 100 feet on each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100-foot area is known as a "stream buffer".

Capability

An evaluation of a resource's inherent potential for use.

Channel Migration

Movement of a stream or river channel within a floodplain area usually over an extended period of time.

Clearcut

The harvesting in one cut of all trees on an area. The area harvested may be a patch, strip, or stand large enough to be mapped or recorded as a separate class in planning for sustained yield. Clearcut size on the Tongass National Forest is limited to 100 acres, except for specific conditions noted in the Alaska Regional Guide.

Climax

A community of plants and animals which is relatively stable over time and which represents the late stages of succession under current climate and soil conditions.

Code of Federal Regulations (CFR)

A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

Commercial Forest Land (CFL)

Productive Forest land that is producing or capable of producing crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

Normal CFL: Timber that can be economically harvested with locally available logging systems. Composed of two categories:

Standard: Timber that can be economically harvested with locally available logging systems, such as highlead or short-span skyline.

Special: Timber that is in areas where special consideration is needed to protect other resources but can be harvested with locally available logging systems.

Non-standard CFL: Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or long-span skyline.

Commercial Thinning

Thinning a stand where the trees to be removed are large enough to sell.

Corridor

Connective links of certain types of vegetation between patches of suitable habitat which are necessary for certain species to facilitate movement of individuals between patches of suitable habitat. Also refers to transportation or utility rights-of-way.

Cover

Refers to trees, shrubs, or other landscape features that allow an animal to partly or fully conceal itself.

Critical Habitat

Specific terrain within the geographical area occupied by threatened or endangered species. Physical and biological features that are essential to conservation of the species and which may require special management considerations or protection are found in these areas.

Crown

The tree canopy. The upper part of a tree or woody plant that carries the main branch system and foliage.

Cruise

Refers to the general activity of determining timber volumes and quality as opposed to a specific method.

Cubic Foot (CF)

Equivalent to a cube of wood with one-foot sides. The cubic foot volume is a measure of the total sound wood in a tree and is a more accurate depiction of wood volume than the board foot measure.

Cull Logs

Trees that do not meet certain quality specifications.

Cultural Resources

Historic or prehistoric objects, sites, buildings, structures, and their remains, resulting from past human activities.

Cumulative Effects

The impacts on the environment resulting from additional incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

Cutover

Areas harvested recently.

DBH

Diameter Breast Height. The diameter of a tree measured 4 feet 6 inches from the ground.

Debris Flow

A general term for all types of rapid movement of debris downslope.

Debris Torrents

Landslides that occur as a result of debris; avalanche materials which either dam a channel temporarily or accumulate behind temporary obstructions such as logs and forest debris.

Deer Winter Range

Locations that provide food and shelter for Sitka black-tail deer under moderately severe to severe winter conditions.

Degradation

The general lowering of the surface of the land by erosive processes, especially by the removal of material through erosion and transportation by flowing water.

Developed Recreation

Recreation that requires facilities that, in turn, result in concentrated use of an area. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, and buildings.

Direct Employment

The jobs that are immediately associated with the Long-term Contract Timber Sale, including, for example, logging, sawmills, and pulp mills.

Discount Rate

The rate used to adjust future benefits or costs to their present value.

Dissolved Oxygen

The amount of free (not chemically combined) oxygen in water.

Diversity

The distribution and abundance of different plant and animal communities and species within the area controlled by the Forest Plan.

Draft Environmental Impact Statement (Draft EIS)

A statement of environmental effects for a major Federal action which is released to the public and other agencies for comment and review prior to a final management decision. Required by Section 102 of the National Environmental Policy Act (NEPA).

Eagle Nest Tree Buffer Zone

A 330-foot radius around eagle nest trees established in an Agreement between the U.S. Fish and Wildlife Service and the Forest Service.

Ecosystem

A community of organisms and its physical setting. An ecosystem, whether a fallen log or an entire watershed, includes resident organisms, non-living components such as soil nutrients, inputs such as rainfall, and outputs such as organisms that disperse to other ecosystems.

Effects

Effects, impacts, and consequences as used in this environmental impact statement are synonymous. Effects may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, or social, and may be direct, indirect, or cumulative

Direct Effects: Results of an action occurring when and where the action takes place.

Indirect Effects: Results of an action occurring at a location other than where the action takes place and/or later in time, but in the reasonably foreseeable future.

Cumulative Effects: See Cumulative Effects.

Encumbrance

A claim, lien, charge, or liability attached to and binding real property.

Endangered Species

Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act. See also, threatened species, sensitive species.

Environmental Analysis (EA)

A comprehensive evaluation of alternative actions and their predictable short-term and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions. An EA is less comprehensive than an Environmental Impact Statement (EIS), and may result in a Finding of No Significant Impact; should the EA reveal significant impacts, a full EIS must then be conducted.

Erosion

The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities.

Escapement

Adult anadromous fish that escape from all causes of mortality (natural or human-caused) to return to streams to spawn.

Estuary

For the purpose of this EIS process, estuary refers to the relatively flat, intertidal, and upland areas generally found at the heads of bays and mouths of streams. They are predominately mud and grass flats and are unforested except for scattered spruce or cottonwood.

Even-aged Management

The application of a combination of actions that result in the creation of stands in which trees of essentially the same age grow together. The difference in age between trees in forming the main canopy level of a stand usually does not exceed 20 percent of that age of the stand at harvest rotation age. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

Executive Order

An order or regulation issued by the President or some administrative authority under his or her direction.

Existing Visual Condition

The level of visual quality or condition presently occurring on the ground. The six existing visual condition categories are:

Type I: Natural Condition. Areas in which only ecological change has taken place. Corresponds to the Preservation VQO.

Type II: Natural appearing. Areas in which changes in the landscape are not noticed by the average forest visitor unless pointed out. Corresponds to the Retention VQO.

Type III: Slightly altered. Areas in which changes in the landscape are noticed, but do not attract attention. Corresponds to the Partial Retention VQO.

Type IV: Moderately altered. Areas in which changes in the landscape are easily noticed and may attract attention. Corresponds to the Modification VQO.

Type V: Heavily altered. Areas in which changes in the landscape obviously appear to be major disturbances and stand out as a dominating impression of the landscape. Corresponds to the Maximum Modification VQO.

Type VI: Drastically altered. Areas in which changes in the landscape are in glaring contrast to a natural appearance. Not a VQO.

Final Environmental Impact Statement (FEIS)

The final version of the statement of environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act. It is a revision of the draft environmental impact statement (DEIS) to include public and agency responses to the draft. The decision maker chooses which alternative to select from the Final EIS, and subsequently issues a Record of Decision (ROD).

Fiscal Year (FY)

October 1 through September 30, e.g. October 1, 1992 - September 30, 1993 = FY 93.

Floodplain

That portion of a river valley, adjacent to the river channel, which is covered with water when the river overflows its banks at flood stages.

Fluvial

Of or pertaining to streams and rivers.

Foreground

The stand of trees immediately adjacent to a scenic area, recreation facility, or forest highway; area located less than 1/4 mile from the viewer. See also, Background and Middleground.

Forest and Rangeland Renewable Resources Planning Act of 1976 (RPA)

Amended in 1976 by the National Forest Management Act. See RPA Assessment and Program.

Forest or Forest Land

National Forest lands currently supporting or capable of supporting forests at a density of 10 percent crown closure or better. Includes all areas with forest cover, including old growth and second growth, and both commercial and non-commercial forest land.

Forested Wetland

A wetland whose vegetation is characterized by an overstory of trees that are 20 feet or taller.

FSH

Forest Service Handbook.

FSM

Forest Service Manual.

Geographic Information System (GIS)

An information processing technology to input, store, manipulate, analyze, and display spatial and attribute data to support the decision-making process. It is a system of computer maps with corresponding site specific information that can be electronically combined to provide reports and maps.

Geomorphology

The study of the forms of the land surface and the processes producing them. Also the study of the underlying rocks or parent materials and the landforms present which were formed in geological time.

Groundwater

Water within the earth that supplies wells and springs.

Guideline

A preferred or advisable course of action or level of attainment designed to promote achievement of goals and objectives.

Habitat

The sum total of environmental conditions of a specific place occupied by an organism, population, or community of plants and animals.

Habitat Capability

The number of healthy animals that a habitat can sustain. Used in wildlife models to calculate rough population estimates for management indicator species.

Habitat Improvement

Management of wildlife and fish habitat to increase their capability.

Hard Snags/Soft Snags

Hard snags are dead trees which have little decay and are generally still hard wood. Soft snags are dead trees which have a considerable amount of decay and are generally soft, broken wood.

IMPLAN

A computer-based system used by the Forest Service for constructing nonsurvey input/output models to measure economic input. The system includes a data base for all counties in the United States and a set of computer programs to retrieve data and perform the computational tasks for input/output analysis.

Indirect Employment

The jobs in service industries that are associated with the Long-term Contract timber sale including, for example, suppliers of logging and milling equipment.

Inoperable Timber

Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitations.

Interdisciplinary Team (IDT)

A group of people with different backgrounds assembled to research, analyze, and write a project Environmental Impact Statement. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze a proposed action and its alternatives.

Issue

A point, matter, or section of public discussion or interest to be addressed or decided.

Knutsen-Vandenburg Fund (KV)

The portion of timber sale receipts collected and used for reforestation and other renewable resource projects on the sale area.

Land Allocation

The decision to use land for various resource management objectives to best satisfy the issues, concerns and opportunities and meet assigned forest output targets.

Land Use Designation

A defined area of land specific to which management direction is applied in the Forest Plan.

Land Use Prescriptions

Specific management direction applied to a defined area of land to attain multiple use and other goals and objectives.

Landslides

The moderately rapid to rapid down slope movement of soil and rock materials that may or may not be water-saturated.

Large Woody Debris

Any large piece of relatively stable woody material having a diameter of at least four inches and a length greater than three feet that intrudes into the stream channel. Also called Large Organic Debris (LOD).

Log Transfer Facility (LTF)

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft, or the formation of a log raft. It is wholly or partially constructed in waters of the United States and location and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed "terminal transfer facility" or "log dump".

Logging Systems

Highlead: A cable yarding system, using a two-drum yarder, in which lead blocks are hung on a spar or tower to provide lift to the front end of the logs. Grabinski is a modified highlead cable system.

Aerial Logging Systems: Systems where the cut logs are moved from the stump to the loading area or log deck without touching the ground.

Live skyline/gravity carriage return: A two-drum, live skyline yarding system in which the carriage moves down the skyline by gravity; thus, is restricted to uphill yarding; the skyline is lowered to attach logs then raised and pulled to the landing by the mainline.

Live skyline/haulback required: A live skyline yarding system composed of skyline, mainline, and haulback; the carriage is pulled to the woods by the haulback; the skyline is lowered to permit the chokers to be attached to the carriage, and the turn is brought to the landing by the mainline.

Running skyline: A yarding system with three suspended moving lines, generally referred to as the main, haulback, and slack-pulling, that when properly tensioned will provide lift, travel, and control to the carriage; normally indicates a gantry type tower and a three-drum yarder.

Standing skyline: Used wherever yarding distances or span distances exceed the capability of live skyline equipment.

Multispan skyline: European equipment is commonly associated with this.

Tractor: Used to describe the full range of surface skidding equipment, designed to operate on level to downhill settings.

Shovel: A system of short-distance logging in which logs are moved from the stump to the landing by repeated swinging with a swing-boom log loader; the loader is walked off the haul road and out into the harvest unit; logs are moved and decked progressively closer to the haul road with each pass of the loader; when logs are finally decked at roadside, the same loader, or a different loader, loads out trucks. On gentle ground, logs are either heeled and swung or dragged by the boom as it rotates; larger log length and tree length logs are usually dragged to maintain machine stability. Soils should be moderate to well drained and side slopes must be less than 20 percent; passes or stripes should be kept to a maximum of four.

Helicopter: Flight path cannot exceed 40 percent downhill or 30 percent uphill; landings must be selected so there is adequate room for the operation and so that the helicopter can make an upwind approach to the drop zone.

A-frame: Beach fringe timber which is logged with a float mounted yarder typically rigged in a highlead configuration for direct A-frame yarding.

Cold-deck and swing: Planned to access areas not suitable for skyline operations.

MBF

A thousand board feet net sawlog and utility volume.

MMBF

A million board feet net sawlog and utility volume.

MMCF

A million cubic feet net sawlog and utility volume.

Management Indicator Species (MIS)

Species selected in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish, including those that are socially or economically important.

Management Prescriptions

Method of classifying land uses presented in the 1997 Tongass Land and Resource Management Plan (Forest Plan). Replaces the land use designations originally presented in the Forest Plan.

Management Requirement

Standards for resource protection, vegetation manipulation, silvicultural practices, even-aged management, riparian areas, soil and water and diversity, to be met in accomplishing National Forest System goals and objectives (see 36 CFR 219.17).

Mass Failure

The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture and does not include individual soil particles displaced as surface erosion.

Maritime Climate

Weather conditions controlled by an oceanic environment characterized by small annual temperature ranges and high precipitation.

McGilvery (Soil series)

Soil series which represents the only well-drained organic soil found in the Ketchikan Area. It is composed of a thin surface layer (less than 8 inches deep) of organic material overlying bedrock. These soils are associated with cliffs and rock outcrops, and are sensitive to disturbance.

Memorandum of Understanding (MOU)

A legal agreement between the Forest Service and others agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A memorandum of understanding is not a fund obligating document.

Microclimate

The temperature, moisture, wind, pressure, and evaporation (climate) of a very small area that differs from the general climate of the larger surrounding area.

Middleground

The visible terrain beyond the foreground where individual trees are still visible but do not stand out distinctly for the landscape; area located from 1/4 to 5 miles from the viewer. See also, Foreground and Background.

Mineral Soils

Soils consisting predominately of, and having its properties determined by, mineral material.

Minimum Viable Population

A population with the estimated numbers and distribution of reproductive individuals to maintain the population over time.

Mining Claims

A geographic area of the public lands held under the general mining laws in which the right of exclusive possession is vested in the locator of a valuable mineral deposit.

Mitigation

Measures designed to counteract environmental impacts or to make impacts less severe. These may include: avoiding an impact by not taking a certain action or part of an action;

minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Mixed Conifer

In Southeast Alaska, mixed conifer stands usually consist of western hemlock, mountain hemlock, Alaska yellowcedar, Western redcedar, and Sitka spruce species. Shore pine may occasionally be present depending on individual sites.

Model

A representation of reality used to describe, analyze, or understand a particular concept. A model may be a relatively simple qualitative description of a system or organization, or a highly abstract set of mathematical equations. A model has limits to its effectiveness, and is used as one of several tools to analyze a problem.

Monitoring

A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring can occur at different levels: to confirm whether mitigation measures were carried out in the manner called for, to determine whether the mitigation measures were effective, or to validate whether overall goals and objectives were appropriate. Different levels call for different methods of monitoring.

Multiple-aged Stands

An intermediate form of stand structure between even and uneven-aged stands. These stands generally have two or three distinct tree canopy levels occurring within a single stand.

Multiple Use

The management of all the various renewable resources of the National Forest System to be used in the combination that will best met the needs of the American people.

Muskeg

In Southeast Alaska, a type of bog that has developed over thousands of years in depressions or flat areas on gentle to steep slopes. Also called peatlands.

National Environmental Policy Act (NEPA) of 1969

An Act to declare a national policy which will encourage productive and enjoyable harmony between humankind and the environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the Nation, and to establish a Council on Environmental Quality (The Principal Laws Relating to Forest Service Activities, Agricultural Handbook 453. USDA Forest Service, 359 pp.).

National Forest Management Act (NFMA)

A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

National Wild and Scenic River System

Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 and amended in 1986, for preservation of their free-flowing condition. May be classified and administered under one or more of the following categories: Wild, Scenic, and/or Recreational.

Native Selection

Application by Native corporations and individuals to a portion of the USDI Bureau of Land Management for conveyance of lands withdrawn in fulfillment of Native entitlements established under ANSCA.

Net Sawlog Volume

Tree or log volume suitable in size and quality to be processed into lumber. In Southeast Alaska, depending on the market, the volume may be processed as pulp or lumber.

No-action Alternative

The most likely condition expected to exist in the future if current management direction were to continue unchanged.

Non-commercial Forest Land

Land with more than 10 percent cover of commercial tree species but not qualifying as Commercial Forest land.

Non-commercial species

Species that have no economic values at this time nor anticipated timber value within the near future.

Non-Forest Land

Land that has never supported forests and lands formerly forested but now developed for such nonforest uses as crops, improved pasture, etc.

Notice of Intent (NOI)

A notice printed in the Federal Register announcing that an Environmental Impact Statement will be prepared. The NOI must describe the proposed action and possible alternatives, describe the agency's proposed scoping process, and provide a contact person for further information.

Objectives

The precise steps to be taken and the resources to be used in achieving goals.

Offering

A Forest Service specification of timber harvest units, subdivisions, roads, and other facilities and operations to meet the requirements of a contract.

Offering Area

A geographic area identified by the Forest Service within which the offering specifications are outlined. One or more offering areas may be identified within all or a portion of a project area.

Old Growth

Ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of forest stand development that typically differ from earlier stages in a variety of characteristics which may include larger tree size, higher composition, and different ecosystem function. The structure and function of an old-growth ecosystem will be influenced by its stand size and landscape position and context

Organic Soils

Soils that contain a high percentage (generally greater than 20 to 30 percent) of organic matter throughout the soil depth.

Parent Material

The unconsolidated and partially weathered material (or the C Horizon) from which upper layers of soil developed.

Partial Cut

Method of harvesting trees where any number of live stems are left standing in any of various spatial patterns. This does not include clearcutting. Can include seed tree, shelterwood, or other methods.

Patch

A non-linear surface area differing in appearance from its surroundings.

Payments to States

A fund consisting of approximately 25 percent of the gross annual timber receipts received by the National Forests in that state. This is returned to the State for use on roads and schools.

Peak flow

The highest discharge of water recorded over a specified period of time at a given stream location. Often thought of in terms of spring snowmelt, summer, fall, or winter rainy season flows. Also called maximum flow.

Planning Area

The area of the National Forest System controlled by a decision document.

Planning Record

A system that records decisions and activities that result from the process of developing a forest plan, revision, or significant amendment.

Plant Association

Climax plant community type.

Plant Communities

Aggregations of living plants having mutual relationships among themselves and to their environment. More than one individual plant community.

Pole

An immature tree between 5 and 9 inches diameter breast height.

Population Viability

Ability of a population to sustain itself.

Present Net Value (PNV)

The difference between the benefits and costs associated with the alternatives.

Primary Stream Production

Results from photosynthesis by green plants. In streams, includes production from algae and aquatic plants, and from non-stream sources such as leaf litter.

Process Group

A combination of similar channel types based on major differences in landform, gradient, and channel shapes.

Public Participation

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service activities.

Receipts

Those priced benefits for which money will actually be paid to the Forest Service: recreation fees, timber harvest, mineral leases, and special use fees.

Record of Decision

A document separate from but associated with an Environmental Impact Statement which states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not.

Reforestation

The natural or artificial restocking of an area with trees.

Regeneration

The process of establishing a new crop of trees on previously harvested land.

Regional Forester

The Forest Service official responsible for administering a single region.

Regional Guide

The guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended. It guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands within a given region.

Rehabilitation

Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.

Resident Fish

Fish that are not anadromous and that reside in freshwater on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat trout.

Resource values

The tangible and intangible worth of forest resources.

Responsible Official

The Forest Service employee who has the delegated authority to make a specific decision.

Restoration

The Long-term placement of land back into its natural condition or state of productivity.

Revegetation

The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

Riparian Area

Area with distinctive resource values and characteristics that contain elements of aquatic and riparian ecosystems, which can be geographically delineated.

Riparian Ecosystem

Land next to water where plants that are dependent on a perpetual source of water occur.

Roads

Arterial: Roads usually developed and operated for Long-term land and resource management purposes to constant service.

Collector: Collects traffic from Forest local roads; usually connects to a Forest arterial or public highway.

Local: Provides access for a specific resource use activity such as a timber sale or recreational site, although other minor uses may be served.

Pre-planned: Roads planned in a prior EIS.

Temporary: For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part of the permanent Forest transportation network and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

Roadless Area

An area of undeveloped public land within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

Rotation

The planned number of years (approximately 100 years in Alaska) between the time that a Forest stand is regenerated and its next cutting at a specified stage of maturity.

Rotation Age

The age of a stand when harvested at the end of a rotation.

RPA Assessment and Program

The RPA Assessment is prepared every ten years and describes the potential of the nation's forests and rangelands to provide a sustained flow of goods and services. The RPA Program is prepared every five years to chart the Long-term course of Forest Service management of the National Forests, assistance to State and private landowners, and research. They are prepared in response to Sections 3 and 4 of the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) (16 U.S.C. 1601).

Sawlog

That portion of a tree that is suitable in size and quality for the production of dimension lumber collectively known as sawtimber.

Scheduled Lands

Land suitable and scheduled for timber production and which are in the land base for the calculation of the allowable sale quantity and Long-term sustained yield timber capacity.

Scheduled Timber Harvests

Timber harvests done as part of meeting the allowable sale quality.

Scoping Process

Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action, and the range of actions, alternatives, and impacts to considered in an EA or an EIS.

Scrub-Shrub Wetland

Wetlands dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. In Southeast Alaska this includes forested lands where trees are stunted because of poor soil drainage.

Second Growth

Forest growth that has become established following some disturbance such as cutting, serious fire, or insect attack; even-aged stands that will grow back on a site after removal of the previous timber stand.

Sediment

Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface.

Seed Tree

Small number of seed-bearing trees left singly or in small groups after timber harvest to provide seed for regeneration of the site.

Selective Cutting

The annual or periodic removal of trees (particularly the mature), individually or in small groups from an uneven-aged forest to achieve the balance among diameter classes needed for sustained yields, and in order to realize the yield, and establish a new crop of irregular constitution. Note: The improvement of the Forest is a primary consideration.

Sensitive Species

Plant and animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on a non-official State list, or that are recognized by the regional forester as needing special management to prevent placement on Federal or state lists.

Sensitivity Level

A map inventory that measures peoples' concern for the scenic quality of the National Forests. In 1980, the Tongass National Forest assigned sensitivity levels to land areas viewed from anchorages, plane and boat routes, roads, trails, public-use areas, and recreation cabins.

Level I: Includes all seen areas from primary travel routes, use areas, and water bodies where at least three-fourths of the Forest visitors have a major concern for scenic quality.

Level II: Includes all seen areas from primary travel routes, use areas, and water bodies where at least one-fourth of the Forest visitors have a major concern for scenic quality.

Level III: Includes all seen areas from secondary travel routes, use areas, and water bodies where less than one-fourth of the Forest visitors have a major concern for scenic quality.

Shelterwood Cutting

A harvest method in which most of the trees are removed in an initial entry and some trees are left to naturally reseed the area and provide protection to new seedlings that establish on the site. A second entry is conducted later to remove the remaining trees.

Silviculture

The science of controlling the establishment, composition, and growth of forests.

Single-tree selection

A cutting method to develop and maintain uneven-aged stands by removal of selected trees from specified age classes over the entire stand area in order to meet a predetermined goal of age distribution and species in the remaining stand.

Site Index

A measure of the relative productive capacity of an area for growing wood. Measurement of site index is based on height of the dominant trees in a stand at a given age.

Site Preparation

Manipulation of the vegetation or soil of an area prior to planting or seeding. The manipulation follows harvest, wildfire, or construction in order to encourage the growth of favored species. Site preparation may include the application of herbicides, burning, or cutting of living vegetation that competes with the favored species; tilling the soil; or burning of organic debris (usually logging slash) that makes planting or seeding difficult.

Site Productivity

Production capability of specific areas of land.

Slope Distance

Distance measured along the contour of the ground.

Smolt

Young silvery-colored salmon or trout which move from freshwater streams to saltwater.

Snag

A standing dead tree, usually greater than 5 feet tall and 6 inches in diameter at breast height.

Soil Productivity

The capacity of a soil, in its normal environment, to produce a specific plant or sequence of plants under a specific system of management.

Soil Quality Standards

Standards that are a combination of 1) "threshold" values for severity of soil property alteration, or significant change in soil properties conditions, and 2) a real extent of disturbance.

Special Habitats

Structural elements of ecosystems. These may include, but are not limited to: snags, spawning gravels, fallen trees, aquatic reefs, caves, seeps, and springs.

Split Yarding

The process of separating the direction of timber harvest yarding into opposite directions.

Stand (Tree Stand)

An aggregation of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from the forest in adjoining areas.

Standard

A course of action or level of attainment required by the forest plan to promote achievement of goals and objectives.

State Historic Preservation Officer (SHPO)

State appointed official who administers Federal and State programs for cultural resources.

Stocking

The degree of occupancy of land by trees as measured by basal area or number of trees and as compared to a stocking standard; that is, the basal area or number of trees required to fully use the growth potential of the land.

Stream Classes

See Aquatic Habitat Management Unit.

Stream Order

First order streams are the smallest unbranched tributaries; second order streams are initiated by the point where two first order streams meet; third order streams are initiated by the point where two second order streams meet, and so on.

Structural Diversity

The diversity of forest structure, both vertically and horizontally, which provides for a variety of forest habitats such as logs and multi-layered forest canopy for plants and animals.

Stumpage

The value of timber as it stands uncut in terms of dollar value per thousand board feet.

Subsistence

Section 803 of the Alaska National Interest Lands Conservation Act defines subsistence use as, "the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade."

Subsistence Use Area

Important Subsistence Use Areas include the "most reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

Substantive Comment

A comment that provides factual information, professional opinion, or informed judgement germane to the action being proposed.

Substrate

The type of material in the bed (bottom) of rivers and streams.

Succession

The ecological progression of community change over time, characterized by displacements of species leading towards a stable climax community.

Suitable

Commercial forest land identified as having both the biological capability and availability to produce industrial wood products.

Suitable Forest land

Forest land for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions, and for which there is reasonable assurance that such lands can be adequately restocked, and for which there is management direction that indicated that timber production is an appropriate use of that area.

Suspended Sediment

The very fine soil particles which remain in suspension in water for a considerable period of time without contact with the stream or river channel bottom.

Sustained Yield

The amount of renewable resources that can be produced continuously at a given intensity of management.

TLMP

See Tongass Land and Resource Management Plan.

Tentatively Suitable Forest Land

Forest land that is producing or is capable of producing crops of industrial wood and: (a) has not been withdrawn by Congress, the Secretary of Agriculture or the Chief of the Forest Service; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity, or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities.

Thinning

The practice of removing some of the trees in a stand so that the remaining trees will grow faster due to reduced competition for nutrients, water, and sunlight. Thinning may also be done to change the characteristics of a stand or wildlife or other purposes. Thinning may be done at two different stages.

Threatened Species

Plant or animal species which is likely to become endangered throughout all or a significant portion of its range within the foreseeable future, as defined in the Endangered Species Act of 1973, and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species. (See also, endangered species, sensitive species.)

Threshold

The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

Tiering

Eliminating repetitive discussions of the same issue by incorporating by reference. The general discussion in an environmental impact statement of broader scope; e.g., this document is tiered to the Tongass Land Management Plan, as amended.

Timber Appraisal

Establishing the fair market value of timber by taking the selling value minus manufacturing costs, the cost of getting logs from the stump to the manufacturer, and an allowance for profit and risk.

Timber Classification

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications used for this purpose.

Nonforest: Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.

Forest: Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Suitable or suitable available: Land to be managed for timber production on a regulated basis.

Unsuitable: Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the Forest planning process.

Commercial forest: Forest land tentatively suitable for the production of continuous crops of timber and that has not been withdrawn.

Timber Harvest Unit

A "Timber Harvest Unit" is a portion of a timber sale within which Forest Service specifies for harvest all or part of the timber to meet the requirements of a timber sale contract.

Timber Stand Improvement (TSI)

All noncommercial intermediate cutting and other treatments to improve composition, condition, and volume growth of a timber stand.

Tongass Land and Resource Management Plan (Forest Plan)

The 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning, the daily uses, and the activities carried out within the forest. Currently under revision.

Turbidity

An indicator of the amount of sediment suspended in water.

Understory

The trees and shrubs in a forest growing under the canopy or overstory.

Uneven-aged Management

Forest management techniques which simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes.

Unscheduled Lands

Lands suitable but not scheduled for timber production and which are not in the land base for the calculation of the allowable sale quantity nor Long-term sustained yield timber capacity.

Unsuitable

Forest land withdrawn from timber utilization by statute or administrative regulation; for example, wilderness, or identified as not appropriate for timber production in the forest planning process.

Utility Logs

Those logs that do not meet sawlog grade but are suitable for production of firm usable pulp chips.

VAC

See Visual Absorption Capability.

Value Comparison Unit (VCU)

Areas which generally encompass a drainage basin containing one or more large stream systems; boundaries usually follow easily recognizable watershed divides. Established to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

Viable Population

The number of individuals of a species required to ensure the Long-term existence of the species in natural, self-sustaining populations adequately distributed throughout their region.

Viewshed

An expansive landscape or panoramic vista seen from a road, marine water way, or specific viewpoint.

Visual Quality Objectives (VQO)

Measurable standards reflecting five different degrees of landscape alteration based upon a landscape's diversity of natural features and the public's concern for high scenic quality. The five categories of VQO's are:

Preservation: Permits ecological changes only. Applies to wilderness areas and other special classified areas. Management activities are generally not allowed in this setting.

Retention: Provides for management activities that are not visually evident to the casual Forest visitor.

Partial Retention: Management activities remain visually subordinate to the natural landscape.

Modification: Management activities may visually dominate the characteristics landscape. However, activities must borrow from naturally established form-line color and texture so that the visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

Maximum Modification: Management activities may dominate the landscape but should appear as a natural occurrence when viewed as background.

V-Notches

A deeply incised valley along some waterways that would look like a "V" from a cross-section. These abrupt changes in terrain features are often used as harvest unit or yarding boundaries.

Volume

Stand volume based on standing net board feet per acre by Scribner Rule.

Volume Class

Used to describe the average volume of timber per acre in thousands of board feet (MBF). The seven volume classes include:

Classes 1 to 3: Less than 8 MBF/acre (cleared land, seedlings, or pole timber stands).

Class 4: 8 to 20 MBF/acre.

Class 5: 20 to 30 MBF/acre.

Class 6: 30 to 50 MBF/acre.

Class 7: 50+ MBF/acre.

Watershed

The area that contributes water to a drainage or stream. Portion of the forest in which all surface water drains to a common point. Watersheds can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

Wetland

Areas that are inundated by surface or groundwater frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include: swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds. See the Forest Plan pp. 3-318 and 3-321 for detailed discussion on wetland type definitions.

Wilderness

Areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or humans habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature, with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or a primitive and unconfined type of recreation; areas of at least 5,000 acres are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest. In Alaska, Wilderness has been designated by ANILCA and TTRA.

Wildlife Analysis Area (WAA)

A division of land used by the Alaska Department of Fish and Game for wildlife analysis.

Wildlife Habitat

The locality where a species may be found and where the essentials for its development and sustained existence are obtained.

Windfirm

Trees that have been exposed to the wind throughout their life and have developed a strong root system or trees that are protected from the wind by terrain features.

Windthrow

The act of trees being uprooted by the wind. In Southeast Alaska, Sitka spruce and hemlock trees are shallow rooted and susceptible to windthrow. There generally are three types of windthrow:

Endemic: where individual trees are blown over;

Catastrophic: where a major windstorm can destroy hundreds of acres; and

Management Related: where the clearing of trees in an area make the adjacent standing trees vulnerable to windthrow.

Winter Range

An area, usually at lower elevation, used by big game during the winter months; usually smaller and better-defined than summer ranges.

Yarding

Hauling timber from the stump to a collection point.

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Distribution List

A copy of the Luck Lake Draft EIS was sent to the following agencies, individuals, organizations, businesses, public officials, cities, and IRA tribes. These parties either requested a copy of the Summary and/or EIS during the scoping process, requested a copy of the EIS at some other time in the NEPA process, are part of the Forest Service's mandatory mailing list (Forest Service Handbook 1909.15, Sections 23.2 and 63.1), or are recognized cities or IRA tribes potentially affected by, or interested in, the Luck Lake project. The Summary for the Luck Lake EIS was not printed as a separate document, so anyone requesting a Summary was sent the entire document.

Agencies

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 Alaska Department of Fish and Game
 Alaska Department of Fish and Game, Sport Fishing Division
 Alaska Department of Natural Resources Division of Forestry
 Alaska Department of Transportation
 Alaska Board of Fisheries
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Media

Ketchikan Daily News

Organizations and Businesses

Alaska Forest Association
 Basic Transportation Company
 Central Council, Tlingit and Haida Indian Tribes of Alaska
 Craig Advisory Committee
 Craig Community Association
 Department of Biology, Montana State University
 Forest Guardians, Forest Conservation Council
 Greater Prince of Wales Chamber of Commerce
 Greenpeace, Alaska Forests Campaign
 Ketchikan Pulp Company
 Natural Resource Defense Council
 Prince of Wales Conservation League
 Southeast Alaska Conservation Council
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Appendix A

Reasons for Scheduling the Environmental Analysis of the Luck Lake Project Area

1. General

2. Introduction

3. Objectives

4. Scope

5. Methodology

6. Results

7. Conclusion

Appendix A

Reasons For Scheduling The Environmental Analysis Of The Luck Lake Project Area

Summary

Reasons for scheduling the Luck Lake Project Area at this time may be summarized as follows:

1. The Luck Lake Project Area contains a sufficient number of acres allocated to development land use designations to make timber harvest in the area appropriate under the 1997 Tongass Land and Resource Management Plan (Forest Plan). Available information indicates harvest of the amount of timber being considered for this project can occur consistent with Forest Plan standards and guidelines and other requirements for resource protection.
2. Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
3. Effects on subsistence resources are projected to differ little according to which sequence these areas are subjected to harvest. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence

use and other factors. Harvest of these other areas is foreseeable, in any case, over the forest planning horizon under the Forest Plan.

4. Providing substantially less timber volume than required to meet Forest Plan and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the Luck Lake Project Area is not necessary or reasonable.
5. It is reasonable to schedule harvest in the Luck Lake Project Area at the present time rather than other areas in terms of previous harvest entry and access, level of controversy over subsistence and other effects, and the ability to complete the National Environmental Policy Act (NEPA) process and make timber available to meet the needs of dependent industries. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EIS's that are currently ongoing or scheduled to begin soon.

More detail regarding the scheduling of the environmental analysis for the Luck Lake Project Area is presented in this appendix in three subsections:

Southeast Alaska Timber Demand

Tongass Land Management Plan

Forest Plan Implementation

Southeast Alaska Timber Demand

Introduction

In general, this section indicates that areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act.

Meeting Market Demand

Timber demand in Southeast Alaska can vary dramatically from year to year. The level of demand is dependent on complex interactions among factors that are difficult, if not impossible, for the industry or the Forest Service to predict with accuracy. Such factors include fluctuations in interest rates, housing starts, business cycles in the United States and overseas, changes in the value of the dollar with respect to foreign currencies, changes in import tariffs, and changes in export policies in other countries.

The multi-year timber sale planning process generally requires managers to manage four different groups, or "pools", of timber volume. Included are:

1. **Timber volume in preparation.** This pool of timber contains sales being analyzed and undergoing public comment through the NEPA process. This process can often take from one to four years and ends when a NEPA decision is made, usually issued in the form of a Decision Notice or Record of Decision.
2. **Timber volume in appeals or litigation.** This pool of timber volume contains sales on which action is stayed or deferred as a result of the administrative appeals process or

litigation. As a result, it is not yet available to the program managers for sale. This process can take as little as 60 days, if no appeals are filed, or up to four years if litigated.

3. **Timber volume available for sale.** This pool of timber volume contains sales for which environmental analysis has been completed, administrative appeals and litigation (if any) have been resolved, and is available for managers to schedule for sale offerings. Managers need to maintain enough volume in this pool to be able to schedule future sale offerings in an orderly manner, and to be able to schedule such offerings in the size and configuration which best meets the needs of the public. As a matter of policy and sound business practice, the Forest Service attempts to announce probable future sale offerings at least one year in advance. This allows potential purchasers an opportunity to do their own evaluations of these offerings in order to determine whether to bid on them, and if so, how much to offer.
4. **Timber volume under contract.** The pool of timber volume contains sales which have been sold and a contract issued to a purchaser, but which have not yet been harvested. Timber contracts typically, but not always, give the purchaser three years to harvest and remove the timber purchased. Long standing Forest Service practice is to attempt to maintain about two to three years of unharvested timber volume under contract to timber purchasers. This practice is not limited to the Alaska Region, but is particularly pertinent to Alaska because of the nature of the land base here. The relative absence of roads, the island geography, the steep terrain, and the consequent isolation of much of the timber lands means that timber purchasers need longer than average lead times to plan operations, stage equipment, set up camps, and construct roads prior to beginning harvest.

To be responsive to market demand, the Forest Service attempts to provide an opportunity for the industry as a whole to accumulate a supply of purchased but unharvested timber (i.e. volume under contract) equal to about three years of timber consumption. There are a number of reasons for allowing the accumulation of volume under contract. First, this allows the industry ample time to plan an orderly and systematic harvest schedule that meets all timing restrictions and permit requirements. Second, it allows the industry to better manage its financial resources and to secure financing on the basis of longer term timber supply. Third, it allows time for the necessary infrastructure (roads, log transfer facilities, and logging camps) to be put in place prior to timber harvest. Fourth, it allows the Forest Service to develop an orderly progression of timber management projects in various stages of the planning process. Finally, an ample timber supply gives the industry more opportunity to sustain itself through market cycles. If demand for pulp or lumber in any year suddenly increases, producers will have access to enough timber to respond to the increase in demand without waiting for the Forest Service or the Congress to take action.

Normally, the unharvested volume under contract will be drawn down during high points in the market when mills increase production, and built up when markets are poor and production declines. In addition, during low markets it is normal for significant portions of the timber sale program to go unsold. These sales become "shelf volume", that is they are set aside until market conditions improve. When demand increases to the point that it exceeds the average program level, this volume is taken off the shelf, updated, and offered for sale. Thus, the timber sale process proceeds at a relative even flow, building up shelf volume and volume under contract during down market cycles, and reducing shelf volume and volume under contract during up market cycles, when industry is harvesting at levels exceeding the average level of the program.

For the first time in ten years, the Tongass National Forest is experiencing a situation where shelf volume is being generated. In Table A-1, an asterisk (*) next to the sale name indicates sales which have been offered for sale and have received no bids. This is our current shelf volume; it can be expected to grow as we are still at the bottom of a 50 year market low.

When the market begins to climb, the amount of shelf volume can be expected to decrease as the sales become economical for the industry to operate.

From the initiation of a timber sale project, through EIS and decision document preparation, and to the sale of timber from the project usually requires three to four years or more depending on complexity. Such lengthy preparation time means that in order to have a stable timber supply and be able to respond to upswings in the market, there is a need to have ongoing timber management projects in various stages of the planning process. It is also necessary to have a supply of completed NEPA projects available for sale if an increased market demand is to be met.

The timber industry in Southeast Alaska is now in a period of transition. Following the closings of the timber industry in Southeast Alaska is now in a period of transition. Following the closings of the Alaska Pulp Corporation (APC) pulp mill and the Ketchikan Pulp Company (KPC) pulp mill, new mills are either under construction or are being proposed, and existing mills are being upgraded. There have been ongoing discussions between Forest Service administration, the State of Alaska, industry representatives, and various interest groups regarding a veneer plant at Ward Cove in Ketchikan. A feasibility study has been planned, however at this time no determination about the veneer plant can be made. A new Seley Log and Lumber Company mill opened in February of 1998 on Gravina Island, in the Ketchikan area. The facility will employ 60 people if run at full capacity, and will house both a sawmill and secondary and tertiary manufacturing mills. Product outputs will include decking and fencing, and possibly furniture. The operation is expected to process 30 MMBF annually (Alan Monk Seley Inc., March 1998). As for existing Southeast Alaska mills, the Viking Lumber sawmill in Klawock, on Prince of Wales Island, recently underwent a modernizing upgrade and re-tooling; computerized equipment and a whole-log chipper were added (USDA Forest Service 1996). Also, the APC sawmill in Wrangell has been purchased by Silver Bay Logging (Wrangell Sentinel 1/15/98) and will be manufacturing wood products in 1998. All of these mills will depend to some extent on a supply of timber from the Tongass National Forest.

The market demand analysis in the Forest Plan was based on a study by David Brooks and Richard Haynes, research scientists at the Pacific Northwest Research Station. Following the release of the Forest Plan, a final version of the Brooks and Haynes report was published. It is this final report that is referenced and cited throughout this Appendix. Three scenarios (low, medium, and high) were developed in the study to display the demand for Tongass National Forest timber through the year 2010 (Brooks and Haynes 1997). For the low scenario, high timber selling values, harvest costs and manufacturing costs limit Alaska's share of markets. Under the high scenario, increased harvest and manufacturing efficiency, with resulting lower costs, make Alaskan mills more competitive. Projected annual timber demand for the next decade is 113 MMBF for the low scenario, 133 MMBF for the medium, and 156 MMBF for the high scenario. These three scenarios do not consider the Seley mill that is operating on Gravina Island, the proposed veneer plant, or the reopening of the APC sawmill in Wrangell. Nor do they account for shifting markets in Japan and the recent willingness of the Japanese to purchase Alaskan milled lumber, manufactured wood products, laminates, etc. All of these factors would lead to an increase in demand over the totals listed for the three scenarios.

The Allowable Sale Quantity (ASQ) for the Tongass averages 267 MMBF on an annual basis, however, a level of 200 MMBF or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service are experiencing (USDA Forest Service 1997).

Tongass Land Management Plan

Chapter 1 of this EIS includes an explanation of how this project relates to the Tongass Land Management Plan. That section describes the land use designations which put land areas under different types of management prescriptions. Chapter 1 also explains that the Forest is divided into land areas called value comparison units (VCU's). In most cases, VCU's are roughly equivalent to large watersheds. A VCU may contain one or more land use designation.

The allowable sale quantity (ASQ) calculated in the Forest Plan is an upper limit, by decade, on the volume of timber that may be offered for sale from suitable timber land on the Forest as part of the regularly scheduled timber sale program. The current ASQ is 2.67 billion board feet per decade, which equates to an annual average of 267 million board feet. There are 676,000 acres suitable for timber management under the Forest Plan. Three land use designations (Timber Production, Modified Landscape, and Scenic Viewshed) account for nearly all of these suitable acres (USDA Forest Service 1997).

1. Cumulative Effects

The Forest Plan considers the cumulative effects for forest-wide acres managed for timber production for both the long-term and short-term timber sale programs. These effects are discussed at the end of their respective sections.

Analysis points to the need to schedule harvest in VCU's assigned management prescriptions which permit consideration of timber harvest, including the VCU's within the Luck Lake Project Area. These VCU's would be needed to help meet Forest Plan and TTRA timber supply objectives. The forest-wide cumulative effects analysis in the Forest Plan FEIS supports the conclusion that this harvest can be accomplished within existing standards and guidelines and other requirements for resource protection.

2. Subsistence

With the passage of the Alaska National Interest Lands Conservation Act (ANILCA), Congress recognized the importance of subsistence resources to rural residents of Alaska. In particular, prior to any disposition of public lands, an agency must first complete a subsistence effects evaluation, including consideration of the availability of other lands (ANILCA 810 (a)).

Based on a review of available harvest volumes for each value comparison unit (VCU) on the Ketchikan Area of the Tongass National Forest, it appeared that in order to meet market demand, most of the Timber Production Land Use Designations would need some level of harvest in the first decade of the Forest Plan. A tentative sale schedule was developed, and will be updated every six months based on this analysis (Ketchikan Area Sale Schedule Summary, March 1997). In short, harvesting at this level to meet market demand, would indicate a level of impact to all subsistence use areas. However, the most significant impacts on subsistence deer habitat would not occur until 20 to 30 years after timber harvest when the second-growth canopy closes. When those impacts to subsistence deer habitat are viewed from a reference point 20 years in the future, the particular importance of which areas are scheduled first during a 5-year period appears to be minor.

In considering rural communities that may be most affected by any proposed timber harvest in the Luck Lake Project Area, Coffman Cove appears to have the strongest cultural and subsistence ties to the area. Each community has its own level of reliance on subsistence, as well as its own level of reliance on the Luck Lake Project Area for supplying subsistence resources, especially deer. Detailed information about subsistence use is provided in Chapter 3 of the Luck Lake EIS and the project files.

As a result of several considerations, including the availability of subsistence resources in non-development land use designations on Prince of Wales Island (such as the Honker and Rio Roberts old-growth habitat reserves, the small old-growth habitat reserves within the Project Area, and the Karta Wilderness), standards and guidelines designed to maintain habitat (such as the 1,000-foot beach and estuary fringes), the relative independence of most communities from subsistence resources in the Project Area, as well as analysis contained in the Forest Plan FEIS and earlier analyses, the Forest Service determined to schedule an environmental analysis of the Luck Lake Project Area. Other projects including Central Prince of Wales, Chasina, Polk Inlet, Lab Bay, North Sea Otter Sound, Control Lake, Staney, North Thorne, and others, are being implemented, or will undergo environmental analysis within the next 3 to 5 years.

Extensive forest-wide cumulative effect analysis has been included in the Forest Plan FEIS (Forest Plan FEIS, pp. 3-529 through 3-685). That analysis, and the tables of data with the maps in Appendix H of the Forest Plan FEIS are incorporated by reference into this document. The data in Appendix H indicates subsistence hunting of deer and other uses in virtually every area of the Tongass National Forest that have substantial quantities of harvestable timber. The following community information is extracted directly out of the Forest Plan FEIS:

All (Forest Plan) alternatives should be able to provide habitat capability for deer hunted by Coffman Cove residents. In the long term, projected deer harvest for all rural hunters and all hunters exceed 10 percent of capability. At some point, a restriction in hunting may be necessary (Forest Plan FEIS, page 3-536).

The analysis shown in Chapter 3 of the Luck Lake EIS is supported by the analysis shown above in the Forest Plan FEIS. The analyses for ANILCA section 810 are shown in the Subsistence section of Chapter 3, in this EIS. The determinations made from the ANILCA section 810 analysis and findings will be a part of the Record of Decision for this project.

Forest Plan Implementation

Review of Available Volume

A review was conducted of each VCU for available volume. This analysis was based on computer inventories and Allowable Sale Quantity (ASQ) calculations used for the Forest Plan. All areas available for timber harvest under the Forest Plan can be expected to be entered for harvest sometime in the future if the plan is to be fully implemented. This analysis represents one scenario for meeting the average annual ASQ of 267 MMBF. Obviously, there can be other scenarios which harvest either more or fewer acres in the Project Area and still meet the ASQ. 3,800 acres in the Project Area VCU's are currently suitable and available for timber harvest. A discussion of the Forest Plan's desired future condition for the Project Area, and a breakdown of projected acres harvested by harvest interval are included in Chapter 3 of this EIS (p. 3-33 through 3-35).

Table A-1 displays the Tongass National Forest Sale Schedule for the five year period of fiscal years 1999 through 2003. As is shown in this schedule and the summary in Table A-1, the timber volume projected to be offered from the Tongass is approximately 225 MMBF per year for the next five years, or about 42 MMBF less than the average annual ASQ of 267 MMBF. However, when sales with a high potential for challenge are factored in, the net probable sale offering for the next five years is approximately 123 MMBF per year. The Ketchikan Area portion of the ASQ for the next ten years is 102 MMBF on an average annual basis. See Appendix B of the Forest Plan for a more detailed discussion. It is currently

projected that about 18 MMBF would be available for harvest under the Luck Lake Project and that the volume would be offered in multiple sales, starting in 1999.

Areas Suitable for Timber Harvest

The following is a listing and short description for the Ketchikan Area of existing and possible future timber sale project areas, made up of logical groupings of VCU's. This represents the majority of sites on the Ketchikan Area with suitable acres for timber harvest.

Central Prince of Wales EIS VCU's 557, 577, 579-590, 598-601, 549-554 and 571-574.

The FEIS and ROD for this project were completed in July 1993 with a selected alternative volume of 287 MMBF. Timber sale offerings have been made to KPC under the long-term contract for most of the volume.

North Revilla EIS VCU's 732, 733, 735-740

The Record of Decision for 205 MMBF was signed in August, 1993. Most of the volume in this project was sold in a system of offerings to KPC under the long-term contract. One small area was re-evaluated with an EA and sold under the independent timber sale program.

Polk Inlet EIS VCU's 610-613, 618-622, 624, 674, 675

The Record of Decision for this project was signed in April, 1995. The selected alternative had 112 MMBF of timber volume that has been offered to both KPC and as independent timber sales. The last of the sales from this project are scheduled to be sold in 1999.

Upper Carroll EIS VCU's 737, 744, 746

The ROD for this project was signed in October, 1996, with a selected alternative volume of 34 MMBF. All of this timber has been sold.

Lab Bay EIS VCU's 527-540, 551

A ROD for 42 MMBF was signed in January, 1997. Approximately 1/3 of this volume was sold in 1997. The project is now under litigation.

Control Lake EIS VCU's 574-578, 591-597

A DEIS was published in November, 1995, and a supplement to the DEIS was published in January, 1998. The FEIS/ROD is expected to be completed in 1998.

Chasina EIS VCU's 677-681

A DEIS was published in February, 1997 and a Final EIS is expected to be completed early 1998.

Sea Level EIS VCU's 746, 753, 755-757, 759

Scoping for this project has recently been completed and a DEIS is expected to be published in early 1998. The FEIS is expected in late 1998.

Cholmondeley EIS VCU's 614, 616, 617, 674, and 675.

Scoping for this project has recently been completed and a DEIS is projected in 1998. The FEIS is projected for 1999.

Port Stewart EIS VCU's 713-717, 719, 722-723

The DEIS is projected to be completed in 1998 with the FEIS projected for 1999.

Moir EIS VCU's 694, 695, 699, 700-704

This project is scheduled for field investigations and scoping in 1998. The DEIS is planned for 2000.

Dall Island EIS VCU's on Dall Island

Scoping is scheduled in 2002 with the DEIS in 2003 and FEIS in 2004.

Sukkwon EIS VCU's on Sukkwon Island

Scoping is scheduled in 2002 with the DEIS in 2003 and FEIS in 2004.

Gravina EIS VCU's on Gravina Island

Scoping and the DEIS are scheduled in 2000 with the FEIS projected in 2001.

Note that several sales on the schedule in Table A-1 have not been listed above, including Staney, North Thorne, Fire Cove, and Sunny Cove. These projects are located within the boundaries of the projects listed above.

Reasons for Scheduling the Luck Lake Project for Environmental Analysis

In addition to the Luck Lake Project Area's relative ability to provide timber, other factors considered in scheduling it for environmental analysis at its projected timber volume level included:

- 1) This harvest level is consistent with the Forest Plan.
- 2) Sufficient volume has been determined to be available in the Project Area.
- 3) The number and location of log transfer facilities, or other processing facilities, are sufficient to handle this volume of timber within a three year time frame.

Substantial changes in timber demand or other circumstances could affect the rate at which various areas proceed through the NEPA process or the timing of actual timber sale offerings, but these changes are not expected to alter the sequence for initiating and completing the NEPA process for various areas. Time periods of relatively low market demand provide an opportunity to increase available timber supply in anticipation of cyclical higher demand periods. All areas in which commercial timber harvest is authorized under the Forest Plan are expected to receive some level of timber harvest at some time if the Forest Plan is to be fully implemented. Total environmental impacts viewed in the long term are not expected to differ substantially depending upon the order in which different areas are entered. The "No-Action" Alternative of not proceeding with further harvest at the present is considered in detail in each timber sale project NEPA process. But generally, projects farthest along in the NEPA process are the most efficient and logical to consider for implementation first in order to meet timber supply, timber sale program, and Forest Plan objectives.

Table A-1
Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003

NEPA Project	Sale Name	Volume (MMBF)
Chatham Area		
FY 98		
	Small District Sales	0.6
	Small District Sales*	0.3
NW Baranof	Rodman Bay**	31.2
FY 99		
NW Baranof	Lisa Creek	6.0
8-Fathom	Neka I	9.0
	Small Sales	2.5
FY 00		
Ushk Bay	Poison Cove	19.1
Indian River	Indian River	14.0
	Small Sales	1.0
FY 01		
Port Houghton	Little Lagoon	26.0
Indian River	Ten Mile	7.0
	Small Sales	2.0
FY 02		
8-Fathom	Neka 2	5.0
Finger Mountain	Crab Bay 1	14.2
Finger Mountain	Broad Creek	12.4
	Small Sales	2.0
FY 03		
Ushk Bay	Ushk Bay 1	14.1
Port Houghton	North Houghton	11.0
Finger Mtn.	Inbetween	6.1
	Small Sales	2.0
Stikine Area		
FY 98		
South Lindenberg	South Lindy	10.6
Shamrock	Clover**	17.4
Etolin	Etolin	2.1
Turn	Turn	1.7
Crane/Rowan	Rowan Mt.**	20.2
Crane/Rowan	Crane**	8.4
Todahl BL	Todahl BL*	7.9
Twin Creek	Twin Creek**	3.0
Canal/Hoya	Canal/Hoya***	15.0
Nemo Loop	Nemo**	6.6
South Lindenberg	Dakota**	0.3
South Lindenberg	South Lindy SS 1**	1.6
Bohemia	Bo	1.3
EA	Small District. Sales*	0.1
EA	Small District. Sales	0.1
FY 99		
Houghton/Fanshaw	Fanshaw 1	31.0

Table A-1
Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003

NEPA Project	Sale Name	Volume (MMBF)
Crystal Creek	Crystal Creek	10.0
South Zarembo	Skipping Cow	25.0
Deer Island	Kuakan	17.0
Wrangell Misc. Small	WRD Small Sales	2.0
South Lindenberg	South Lindy I	2.0
FY 00		
Madan	Madan	25.0
King George	Honeymoon	2.0
South Lindenberg	South Lindenberg II	10.0
Woodpecker	Woodpecker	10.0
East Kuiu	Kuiu I	22.0
Etolin	Camp Carl	1.0
Wrangell Misc Small	WRD Small Sales	1.0
Shamrock	Shamrock Small Sales	2.0
FY 01		
Douglas	Douglas I	39.0
Frenchy	Frenchy	3.0
Woodpecker	Track	5.0
Etolin	Mosman	15.0
Woronkofski	Woronkofski	10.0
Wrangell Misc Sales	WRD Small Sales	1.0
South Lindenberg	South Lindy Small Sale	1.0
South Lindenberg	South Lindy II	2.0
FY 02		
Etolin	Whaletail	15.0
Sunny Bay	Sunny Bay	10.0
East Kuiu	Kuiu II	40.0
Sumner	Sumner	6.0
Wrangell Misc Sales	WRD Small Sales	5.0
South Lindenberg	South Lindy Small Sale	1.0
South Lindenberg	South Lindy III	2.0
FY 03		
East Kuiu	Kuiu III	20.0
Scott Peak	Scott Peak	15.0
Overlook	Overlook	5.0
Crystal Creek	Ess Lake	5.0
Etolin	Olive Cove	10.0
Back Channel	Back Channel	10.0
South Lindenberg	South Lindy IV	2.0
South Lindenberg	South Lindy Small Sale	1.0
South Lindenberg	South Lindy Small Sale	1.0
Wrangell Misc Sales	WRD Small Sales	2.0
Petersburg Misc Sales	PRD Small Sales	2.0
Ketchikan Area		
FY 98		
Cloudy	Cloudy	2.8
Brand X	Brand X*	1.8

Table A-1
Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003

NEPA Project	Sale Name	Volume (MMBF)
EA	Peep Rock	1.5
Polk Inlet	Cable/Drop*	11.8
Chasina	Dumpy ATC*	19.7
Picasso	Picasso	0.6
Lab Bay	Big Bob*	7.2
Lab Bay	Summit/Exchange*	11.0
Control Lake	Wolf Pup*	1.2
Control Lake	North Thorne	2.3
Control Lake	Big Salt**	8.2
Control Lake	West Steel	0.3
Control Lake	Hard Steel*	4.8
Control Lake	Lower Rio Beaver	0.1
Control Lake	Musk Rat*	0.1
Control Lake	Rio Beaver*	5.6
Control Lake	Rush Fast*	0.8
Control Lake	Rush Angel*	5.8
	Twin Mt. Salvage	0.7
	Small District. Sales	1.0
	Small District. Sales*	2.4
FY 99		
KRD Small Sales EA	Small Sales	0.5
Sea Level EIS	Toe-Dance	10.0
Sea Level EIS	Madder	10.0
Sea Level EIS	Ten Pin	10.0
Polk Inlet EIS	Longline	2.9
Polk Inlet EIS	Lowboy	1.1
Chasina EIS	South Arm	7.9
Chasina EIS	Port Johnson	11.0
Chasina EIS	North	7.5
LYD & Small Sales	LYD & Small Sales	2.0
TB Small Sales EA	TB Small Sales	5.0
Control Lake EIS	Beaver Pond	0.3
Control Lake EIS	Steel/Roberts	3.9
Control Lake EIS	Logjam	1.8
Control Lake EIS	Kogish	7.5
Control Lake EIS	Control Lake B	10.0
FY 00		
Sea Level EIS	Orion	20.0
Craig Small Sales EA	Craig Small Sales	2.0
Cholmondeley EIS	Sunny Cove	14.0
Cholmondeley EIS	Dr. Point	15.7
TB Small Sales EA	TB Small Sales	5.0
Lab Bay EIS	Thorne Island	3.5
Control Lake EIS	Control Lake A	12.0
Staney EIS	Staney Creek 1	10.0
Luck Lake EA	Luck Lake 1	5.0
Luck Lake EA	Luck Lake 2	8.0
Port Stewart EIS	Mongoose	30.0

Table A-1
Tongass National Forest Timber Sale Schedule for Fiscal Years 1998-2003

NEPA Project	Sale Name	Volume (MMBF)
FY 01		
Craig Small Sales EA	Craig Small Sales	2.0
Cholmondeley EIS	Skowl	6.7
Moirra EIS	Perkins	23.0
TB Small Sales EA	TB Small Sales	5.0
Staney EA	Staney Creek 1	10.0
Staney EA	Staney Creek 2	15.0
Cedar Decline EA	Cedar	5.0
FY 02		
Port Stewart EIS	Cabala	20.0
Gravina EIS	Dutchman	8.0
Gravina EIS	Palisade	7.0
Craig Small Sales	Craig Small Sales	2.0
Moirra EIS	Black	11.3
Moirra EIS	Frederick	11.0
North Dall EIS	Dall	10.0
Control Lake EIS	Control Lake C	9.6
North Thorne EIS	Thorne 1A	4.6
North Thorne EIS	Thorne 2	5.0
Kosciusko Old Growth EIS	KOS 1	8.0
Kosciusko Old Growth EIS	KOS 3	3.0
FY 03		
Port Stewart EIS	Forreous	25.0
Gravina EIS	Frier	5.0
Gravina EIS	Fling	5.0
Craig Small Sales EA	Small Sales	2.0
Scratching EIS	Santa	24.0
Droppings EA	Drops	10.0
Thorne Bay Small Sales EA	Small Sales	5.0
North Thorne EIS	Thorne 1B	3.5
North Thorne EIS	Thorne 3	5.0
North Thorne EIS	Thorne NIC2	5.0
Kosciusko Old Growth EIS	KOS 2	4.0
Kosciusko Old Growth EIS	KOS 4	5.0
Red Bay EA	Red 1	3.0
Red Bay EA	Red 2	1.0
Red Bay EA	Red 3	1.0
Sarkar EIS	Sarkar 1	6.0

* "Shelf Volume" from timber sales offered, but unsold.

** Advertised for sale in FY 98; actual bid opening date scheduled in FY 99.

*** EIS is currently under appeal.

Table A-2
Timber Sale Schedule Summary - Volume (MMBF) by Fiscal Year

	FY 99	FY 00	FY 01	FY 02	FY 03	FY 99-03 Ave.
Chatham Area	18	34	35	34	33	31
Stikine Area	88	86	79	79	73	81
Ketchikan Area	104	96	97	104	110	102
Tongass NF	210	216	211	217	216	214

NOTES

Appendix B

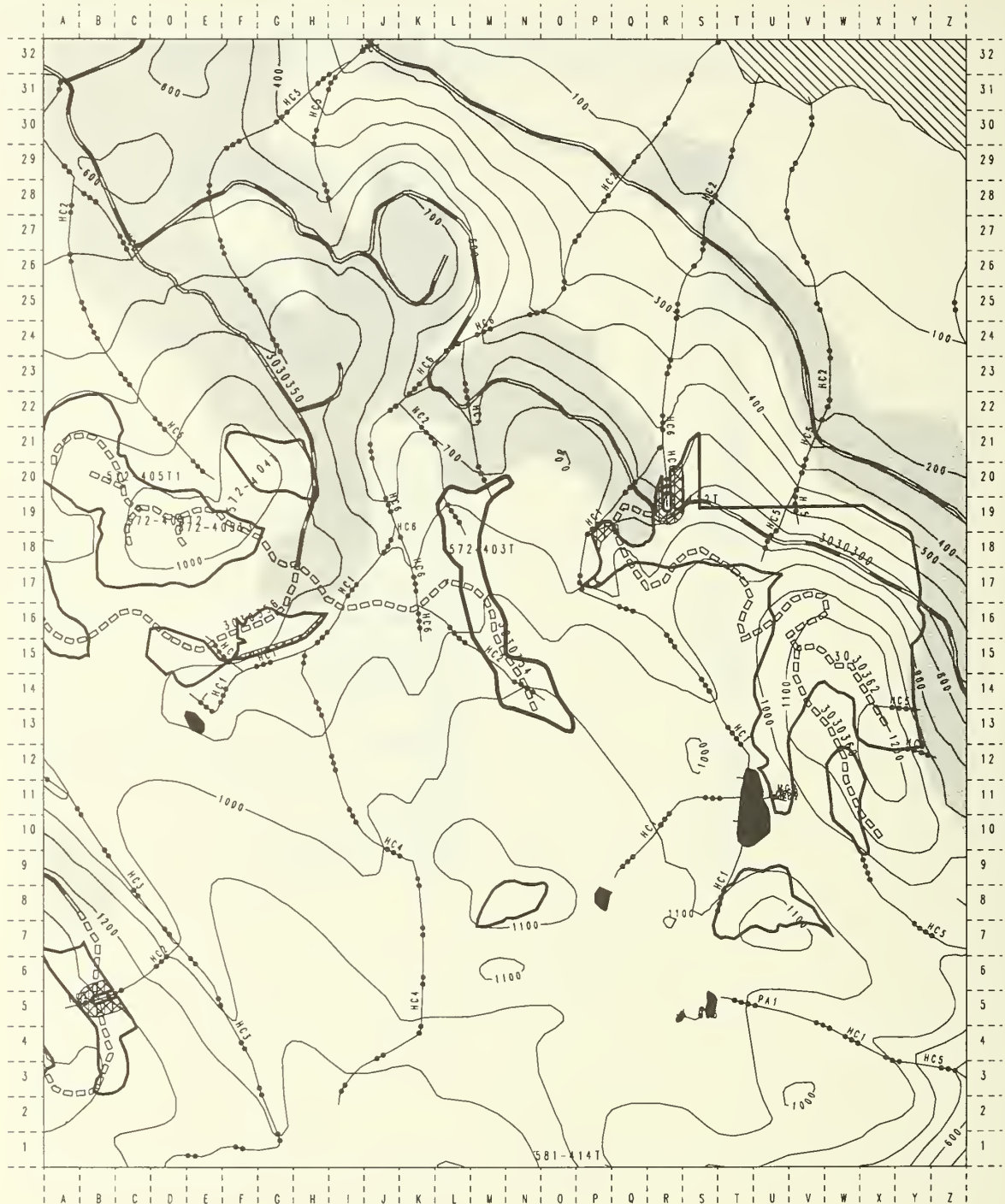
Unit Cards

Acronyms Used on Unit Cards

ADF&G	Alaska Department of Fish and Game
AHMU	aquatic habitat management unit
B/W	blue/white
BF	bank full
BMP	Best Management Practice
CFR	Code of Federal Regulations
DBH	diameter at breast height
DEIS	Draft Environmental Impact Statement
Dq	quadratic mean diameter
E	east
G/W	green/white
HE	helicopter
IT	individual tree
MA	management area
MBF	thousand board feet
M.P.H.	miles per hour
N	north
N/A	not applicable
NOGO	North American goshawk
O/W	orange/white
ROS	Recreation Opportunity Spectrum
RS	running skyline
S	south
S&G's	Standards and Guidelines (from the Forest Plan)
SH	shovel
SL	slackline
TPA	trees per acre
VQO	visual quality objective
W	west

Luck Lake Project Area Draft Unit Card: **572-403** Acres= **18.70**

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

07/23/98 /l/stiles/ret/library/gis/luck/unitcard/unitcard.doc sml

Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-403 **Planned Acres:** 18.7
Silvicultural System : 41-16, 51, 52
WAA Number: 1420

Estimated Volume: 228 MBF
Number of Settings: **Quad:** Craig D-3 NE **Photo:** 1090-217

In Alternatives: 2, 4, 6
Logging systems: SH/RS

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type: Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4: 5	Class 5: 14	Class 6:	Class 7:	Low Productive
Scenery: Managed Viewshed: Alaska Marine Highway	VQO's: Modification				
Recreation: Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 1	
Soils:					
Mass movement Index:	Low	Medium	High	Very High	Unknown
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Slopes Greater Than 72%	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-
Site Productivity Classes 1- 2- 3- 4-					

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry plant association on poorly drained soils. Forested wetlands throughout unit. Slopes less than 50 percent. Partial suspension and shovel yarding will meet resource protection needs. BMP's 12.5 and 13.9.

Timber Input: Soils, slopes and timber type indicate shovel logging will be feasible. In order to meet marten and goshawk standards and guidelines 30% canopy closure will be left. I recommend clumping the leave trees as much as possible to limit operational impacts. If the specific silvicultural prescription limits shovel logging opportunities I recommend a shovel swing running skyline logging method utilizing narrow corridors.

Engineering Input: See attached road card in appendix C.

Fish/Watershed Input: One O/W, Class IV, HC2 found in south end of unit requiring O/W protection. Two G/W, HC2 streams found in the north end of the unit requiring G/W protection. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: NOGO surveys completed: 4/7/97, 4/15/97. Implement marten and goshawk S&G's to maintain an average canopy closure >= 30%.

Recreation/Scenery Input: No concerns.

Lands Input: No state/private or encumbered lands adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

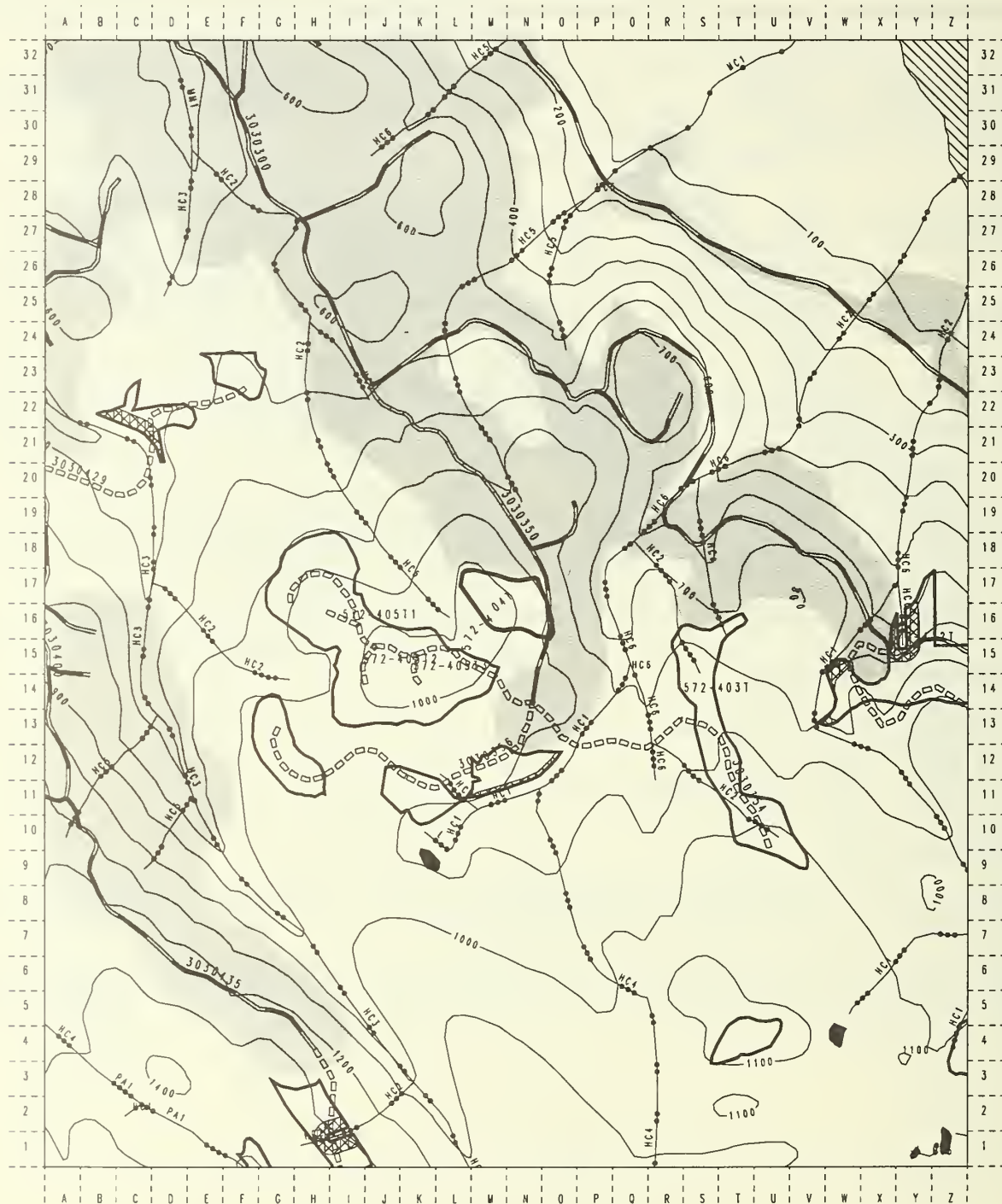
Geological Input: No concerns.

Silviculture Input : Stand exam summary: five acres north end of unit low volume (6.2 MBF/acre). Remainder of unit 31 MBF/acre, average canopy closure = 65%. 87 TPA (live) average DBH = 22", 39 TPA > 21" DBH. Partial harvest feasible.

As mapped, 14 acres in stand 027 has 12.365 MBF hemlock, 9.735 MBF spruce and 9.403 MBF yellowcedar with 31.504 MBF total per acre. 5 acres in stand 029 has 4.755 MBF yellowcedar and 0.717 MBF hemlock with a total of 5.472 MBF per acre. Volume estimates for this stand may be low due to program faults and overestimate of defect in cedars.

Luck Lake Project Area Draft Unit Card: 572-404 Acres= 8.15

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

07/23/88 /luliusa/ref/library/gis/luck/unitcard/unitcarddoc.eml

Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-404 Planned Acres: 8.2 Estimated Volume: 32 MMBF In Alternatives: 2,3,4,5,6
 Silvicultural System : 4116, 4152 or 4145 Number of Settings: Quad: Craig D-3 NE Photo: 1090-217 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4:	Class 5:	Class 6:	Class 7:	Class 7:	Low Productive : 8.2
Scenery:	Managed Viewshed:	Alaska Marine Highway	VQO's: Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1-	2- 3- 4- 5- 8.2
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Forested wetlands interspersed with better drained soils. Slopes less than 50 percent. Partial suspension will meet soils and wetland objectives. BMP's 12.5, 13.9, 13.10, 13.11, and 13.14.

Timber Input: Partial suspension required (BMP's 12.5, 13.9, 13.10, 13.11, 13.14). A small running skyline with lateral yarding capabilities will meet requirements and also provide flexibility to meet marten and goshawk standards and guidelines. Portions of the unit may be shovel logged.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Fisheries recon found no streams in this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: NOGO surveys completed: 4/7/97, 4/15/97. Implement goshawk and martin S&G's to maintain an average canopy closure of \Rightarrow 30%. NOGO survey completed: 07/16/98. NOGO seen flying over unit twice. NOGO survey completed: 07/22/98.

Recreation/Scenery Input: No established recreation use. Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

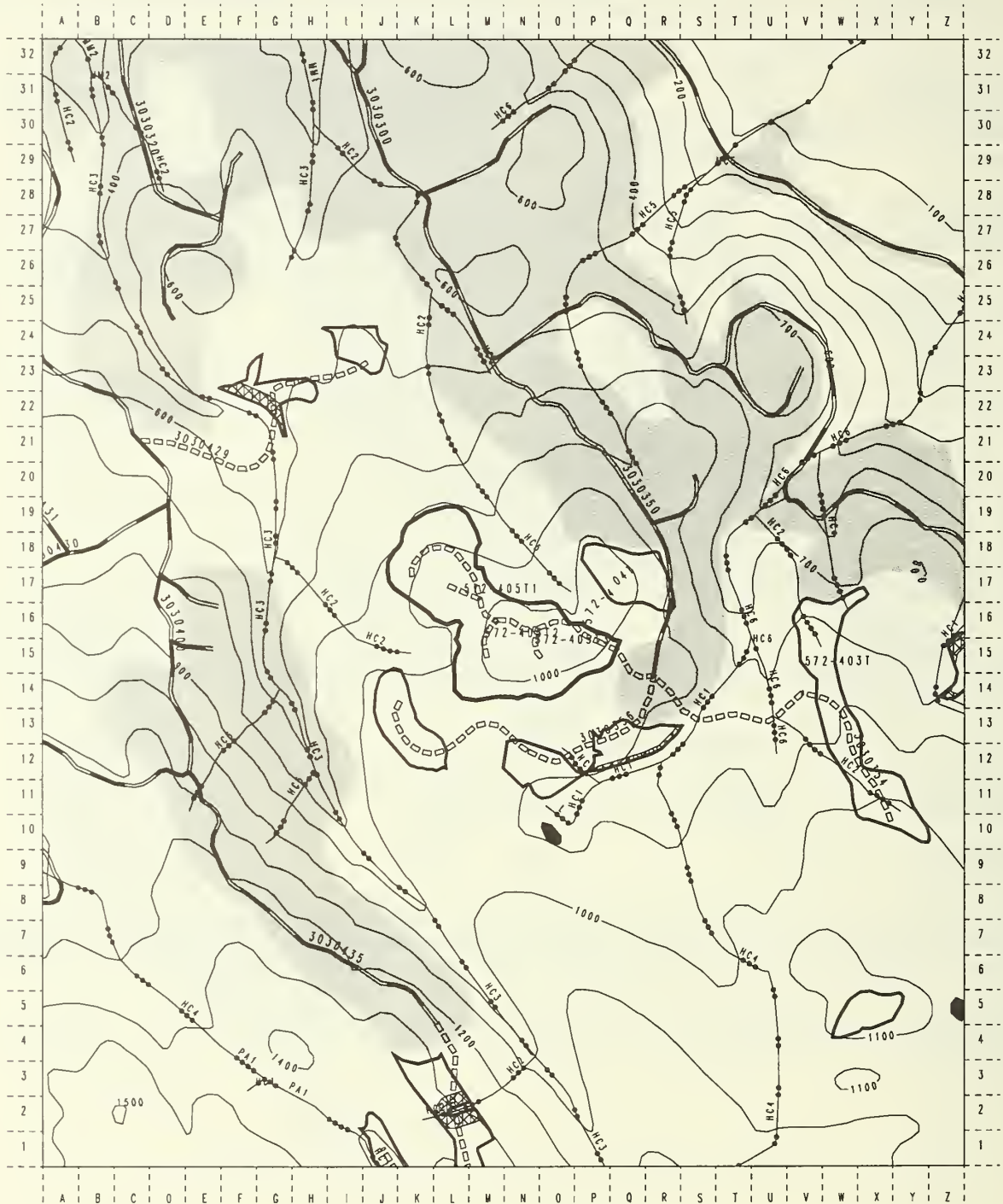
Geological Input: No concerns.

Silviculture Input: Stand exam Summary: This unit contains nine TPA in the 21" size class, 146 TPA live and 48 TPA standing dead, average DBH = 14". Existing canopy closure is 60%; this unit contains 8 MBF/acre. Suggest small group selection harvest to maximize economic return. Other options include salvage, partial overstory removal and clear cut with reserve groups. Exam volume may be underestimated due to overestimates in cedar decay. Soils site index (GIS) shows average site index of 80 but observed site index is closer to 40 or 50.

As mapped, the entire unit is within stand 27 and has 2.178 MBF yellowcedar, 2.129 MBF hemlock and 0.751 MBF redcedar for 5.058 MBF per acre. Volume estimates may be low due to program faults and overestimate of defect in cedars.

Luck Lake Project Area Draft Unit Card: 572-405 Acres= 41.50

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Soilwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-405 Planned Acres: 41.5 Estimated Volume: 402.1 MBF In Alternatives: 2, 3, 4, 5, 6
 Silvicultural System : 4116, 4145, 4152 Number of Settings: Quad: Craig D-3 NE Photo: 1090-217 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: W
Volume class breakdown:	Class 4: 41	Class 5:	Class 6:	Class 7:	Class 7:	Low Productive: 1
Scenery:	Managed Viewshed: Alaska Marine Highway/Coffman Cove				VQO's: Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 4- 41.5	
High Value Habitat:	Sitka Black-Tail Deer- X	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Mixed Conifer/blueberry plant association on poorly drained soils. Complex of forested wetlands and uplands. One short steep slope in the north end of the unit. Partial suspension on steeper slopes and shovel yarding on slopes less than 20 percent on the tops of knobs will meet resource concerns (BMP's 12.5, 13.9). Portions of the unit lie within the City of Coffman Cove water source watershed. Special attention should be given to oil pollution prevention (BMP 12.8) and other hazardous substance spill prevention (BMP 12.9). One class 4 stream see Fish/Watershed section (BMP 13.16). Use retention areas to eliminate lower volume stands adjacent to bogs and meet Forest Plan requirements to avoid harvest on Kitkun soils.

Timber Input: Partial suspension is required on forested wetland soils. This unit can be logged with a running skyline logging system with lateral yarding capabilities, concentrate leave trees on areas of marginal logging feasibility. 30% canopy closure will be maintained throughout the unit. Shovel log the areas on top of the knobs where slopes are less than 30%.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV stream was found along the NE boundary, flagged green/white, HC 5 channel type. No other water quality or fisheries concerns with this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3, and 14.5.

Wildlife Input: Found numerous Bog Orchids along the G/W stream in the NE corner. NOGO surveys completed: 4/07/97, 4/15/97. Implement goshawk and martin S&G's to maintain => 30% canopy closure. Heavy deer use indicated by browse.

Recreation/Scenery Input: No established recreation use. Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside high probability areas for cultural resources.

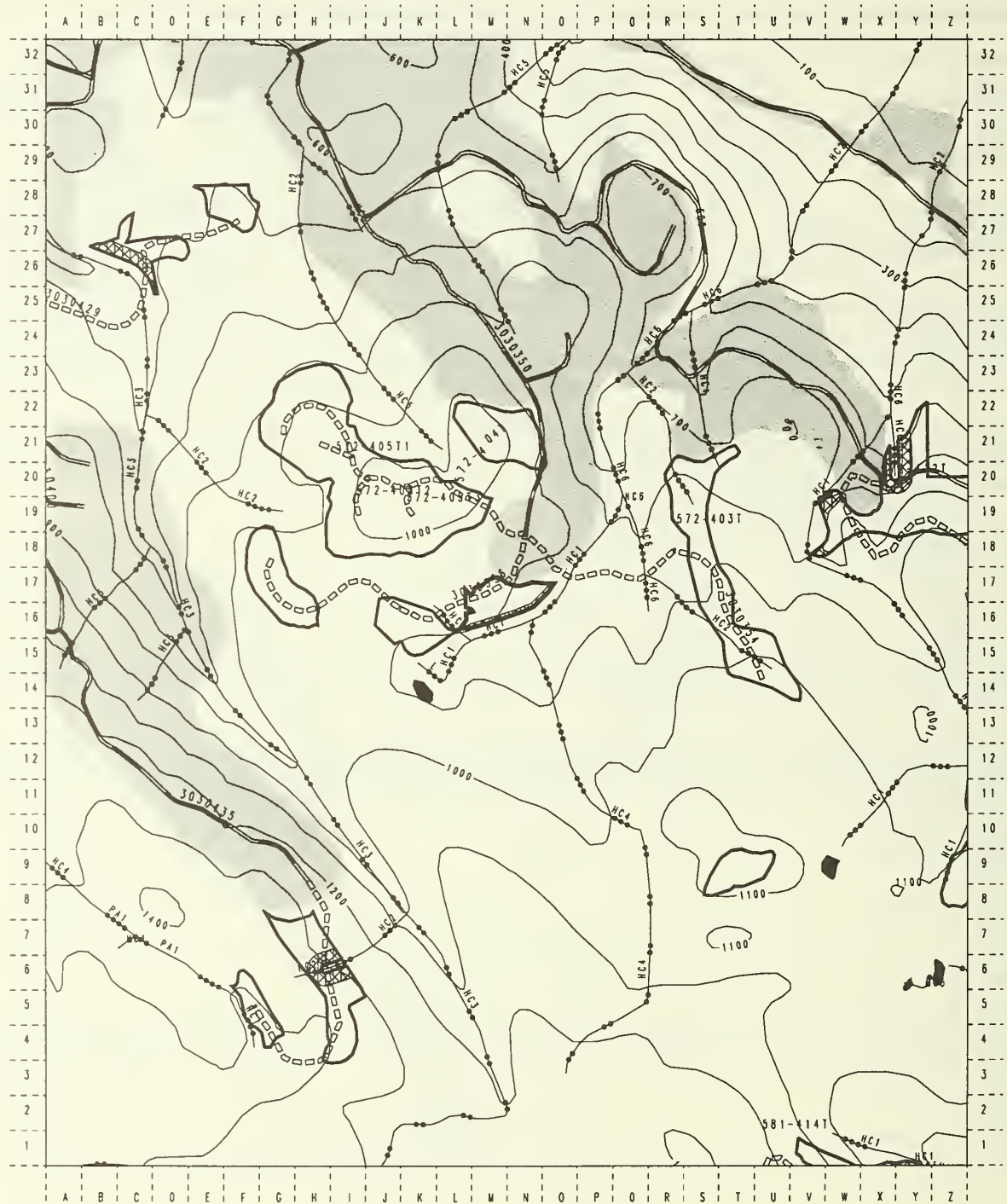
Geological Input: No karst located within the planned unit boundary.

Silviculture Input: Stand exam summary: This unit has an estimated volume of 17 MBF/ acre, with an average canopy closure of 70% and an average DBH of 20". There are 26 TPA in the 21" size class a total of 76 TPA live and 57 TPA standing dead. Yellowcedar decline and stem decays were noted within the unit boundary. Some windthrow also exists. Partial harvest to meet S&G's is feasible using clear cut with reserves (4116) or partial overstory removal and selection method mix (4145, 4151/52).

The entire unit as mapped is within stand 25 and has 6.459 MBF yellowcedar, 8.744 MBF hemlock and 2.886 MBF spruce for a total of 18.090 MBF per acre.

Luck Lake Project Area Draft Unit Card: **572-406 Acres= 5.25**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|-----------------------|-------------------|-----------------------|
| —●— Class 1 stream | □ Second-growth | — Unit Boundary |
| —●●— Class 2 stream | ▨ Windfirm Buffer | — Other unit boundary |
| —●●●— Class 3 stream | ■ Freshwater | — Existing Roads |
| —●●●●— Class 4 stream | ▨ Saltwater | — Reconstruct Roads |
| | | □□□□ Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-406 Planned Acres: 5.5 Estimated Volume: 56.4 MBF In Alternatives: 2,3,4,5,6
 Silvicultural System : 4116 or 4145 with 4151/52 Number of Settings: Quad: Craig D-3 NE Photo: 1090-217 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SE
Volume class breakdown:	Class 4:		Class 5: 5.5	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed	Alaska Marine Highway	VQO: Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4- 5.5		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input : Cedar-hemlock-blueberry-skunk cabbage forested wetlands on poorly drained soils. Slopes less than 50 percent. Shovel yarding on slopes less than 20 percent and partial suspension on steeper slopes will meet resource objectives (BMP 12.5 and 13.9) . Two streams in or adjacent to the unit, see Fish/Watershed section (BMP 13.16 and 12.6a).

Timber Input: Recommend a small running skyline logging system with lateral yarding capabilities on slopes greater than 20%, and shovel logging on slopes less than 20%. Recommend grouping leave trees as much as possible to limit impacts on falling and yarding.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W stream located in this unit, along the southern boundary. Downstream from unit the channel becomes very high gradient HC6 that prevents fish migration. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3, and 14.5.

Wildlife Input: NOGO surveys completed: 4/7/97, 4/15/97. Implement martin and goshawk S&G's to maintain => 30% canopy closure. NOGO surveys completed: 7/16/98, 7/22/98. NOGO seen flying over area.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

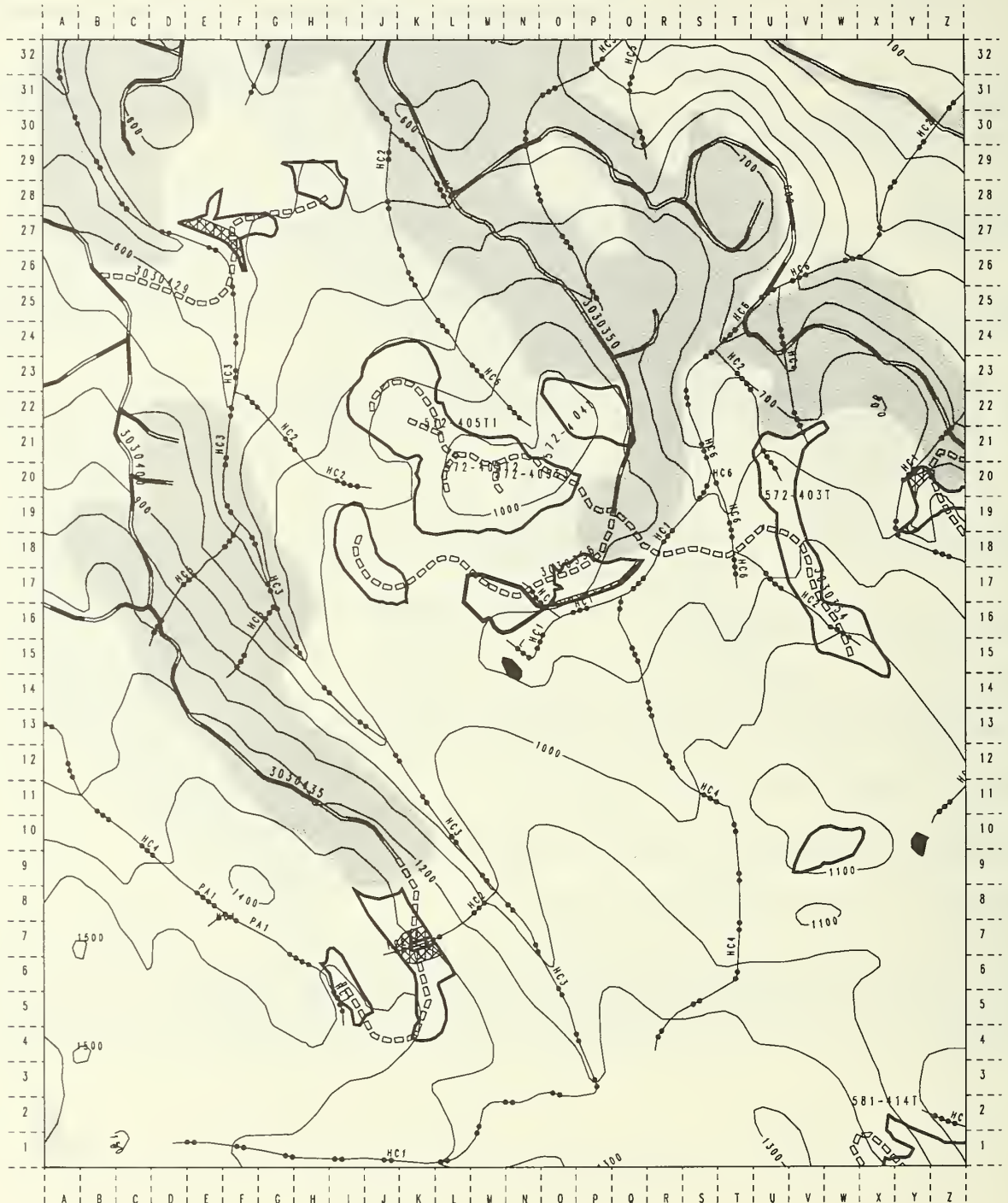
Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No karst located within the planned unit boundaries.

Silviculture Input: Stand exam summary: This unit has an average volume of 21 MBF/ acre with a canopy closure of 60%. There are 24 TPA in the 21" size class, 109 TPA live and 10 TPA standing dead. Some stem decays were noted in hemlock along with minor physical defect. Partial harvest to meet S&G's is feasible using clear cut with reserves (4116) or partial overstory removal with IT/Group selection mix (4145, 4151/52). The unit lies within a portion of stand 27 and has 4.091 MBF yellowcedar, 10.286 MBF hemlock and 6.986 MBF spruce for a total of 21.363 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-407 Acres= 5.53

Mapscale 1:15840 (4 inch to Mile)



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|--------------------|-------------------|-----------------------|
| —●— Class 1 stream | □ Second-growth | — Unit Boundary |
| —●— Class 2 stream | ▨ Windfirm Buffer | — Other unit boundary |
| —●— Class 3 stream | ■ Freshwater | — Existing Roads |
| —●— Class 4 stream | ▨ Saltwater | — Reconstruct Roads |
| | | □ Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-407 Planned Acres: 5.5 Estimated Volume: 63.2 MBF In Alternatives: 2,3,4,5,6
 Silvicultural System: 4116 or 4145 with 4151/52 Number of Settings: Quad: Craig D-3 NE Photo: 1090-217 Logging systems: RS/SH
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SE
Volume class breakdown:	Class 4:	Class 5: 5.5	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Not Seen		VQO: Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	2 & pond	Class IV Streams:	1
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4- 5.5		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Western hemlock-blueberry and cedar-hemlock-blueberry plant association on complex of forested wetland and forested upland. Slopes less than 50 percent. Combination of shovel yarding and partial suspension cable yarding will meet resource objectives for wetlands and soils (BMP's 12.5 and 13.9). See Fish/Watershed section for streamcourse protection (BMP 12.6a and 13.16).

Timber Input: Recommend using a small running skyline system with lateral yarding capabilities in combination with shovel yarding where applicable. Recommend a clearcut with reserve tree prescription to meet martin and goshawk standards and guidelines.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input : One Class IV, G/W, HC2 along east unit boundary. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3 and 14.5.

Wildlife Input: Pond located due south of the unit boundary. NOGO survey completed: 4/7/97, 4/15/97. Implement marten and goshawk S&G's to maintain => 30% canopy closure. High deer use noted, (browse and trails). NOGO survey completed 7/16/98, goshawk seen flying over area.

Recreation/Scenery Input: Unit not seen from any priority travel route or use area. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

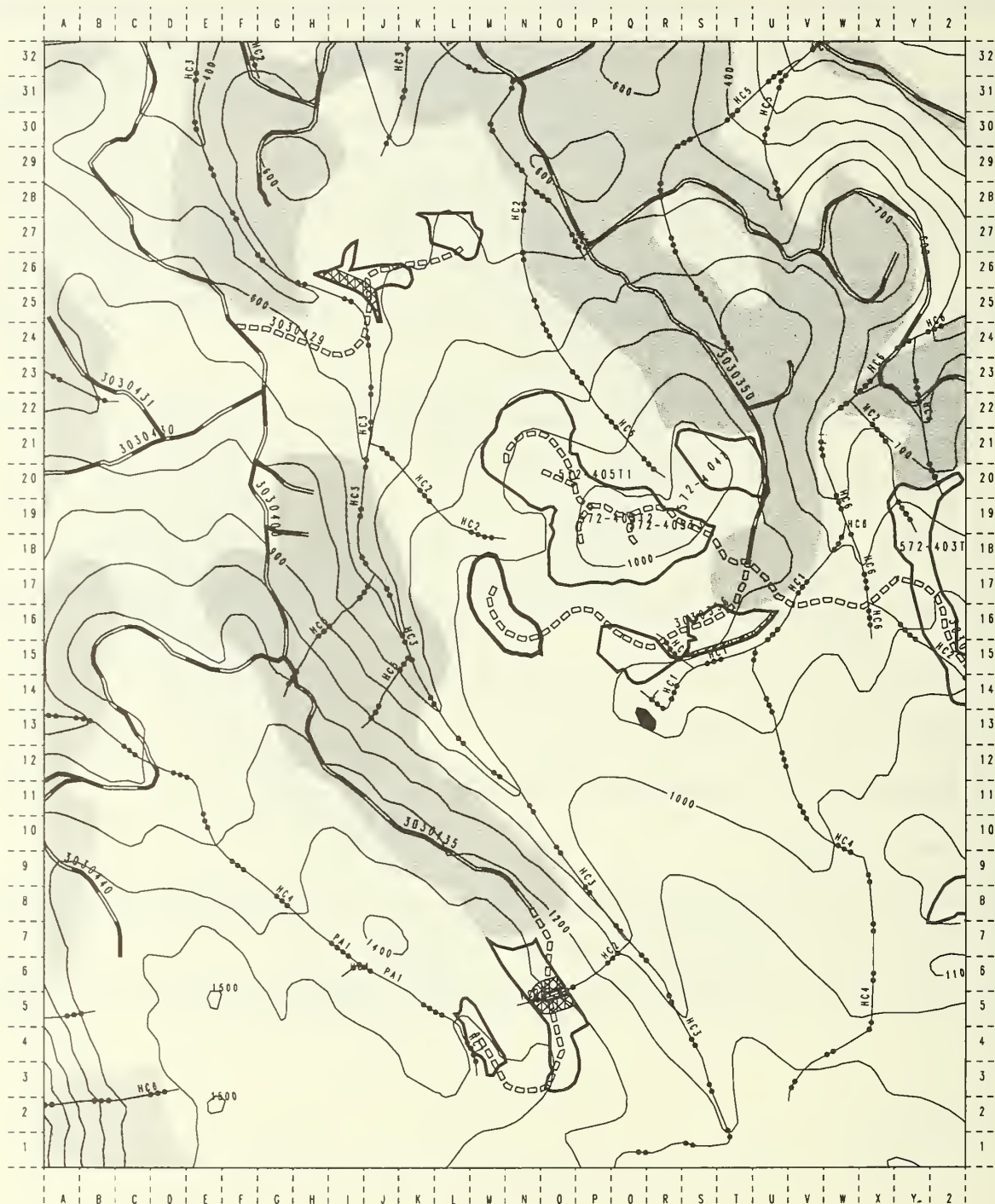
Geological Input: No concerns.

Silviculture Input: Stand exam summary: The unit has an average volume of 23 MBF/acre, 23 TPA in the 21" size class, 67 TPA live and 2-3 TPA standing dead. Partial cut harvest feasible. Significant decay and defect with some mortality present. Partial harvest to meet S&G's is feasible. Use clear cut with reserves (4116) or partial overstory removal with IT/Group selection mix (4145, 4151/52).

This unit lies within a portion of stand 27 and has 15.901 MBF hemlock, 0.458 MBF yellowcedar and 0.458 MBF spruce for a total of 15.901 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-408 Acres= 7.71

Mapscale 1:15840 (4 inch to Mile)



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|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-408 Planned Acres: 7.7 Estimated Volume: 96.6 MBF In Alternatives: 2,4,5,6
 Silvicultural System: 4116 or 4152/51 with 4145 Number of Settings: Quad: Craig D-3 NE Photo: 1090-217 Logging systems: RS/SH
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NW
Volume class breakdown:	Class 4:	Class 5: 7.7	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Alaska Marine Highway/Coffman Cove			VQO's: Modification		
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4- 7.7		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry plant association, mostly uplands but unit is surrounded by non-forested wetlands. Slopes less than 50 percent. Shovel yarding on slopes less than 20 percent and partial suspension cable yarding on the steeper slopes will meet soil protection objectives (BMP's 13.9 and 12.5) Unit lies entirely within the City of Coffman Cove water source watershed. Special care should be taken in the oil and hazardous substances spill prevention plan (BMP's 12.8 and 12.9). One small stream adjacent to the unit, see Fish/Watershed section (BMP 13.16).

Timber Input: Recommend a small running skyline logging system in conjunction with shovel logging. Recommend grouping leave trees as much as possible while meeting martin and goshawk standards and guidelines.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV, G/W, HC2 stream found outside the unit along the north tip and flowing west. No other streams located in this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3 and 14.5.

Wildlife Input: NOGO surveys completed: 4/7/97, 4/15/97. Implement goshawk and martin S&G's to maintain => 30% canopy closure. High levels of deer use (browse) was noted. NOGO surveys completed: 7/16/98, 7/22/98. NOGO seen flying over area.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway and Coffman Cove. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit is outside of high probability areas for cultural resources.

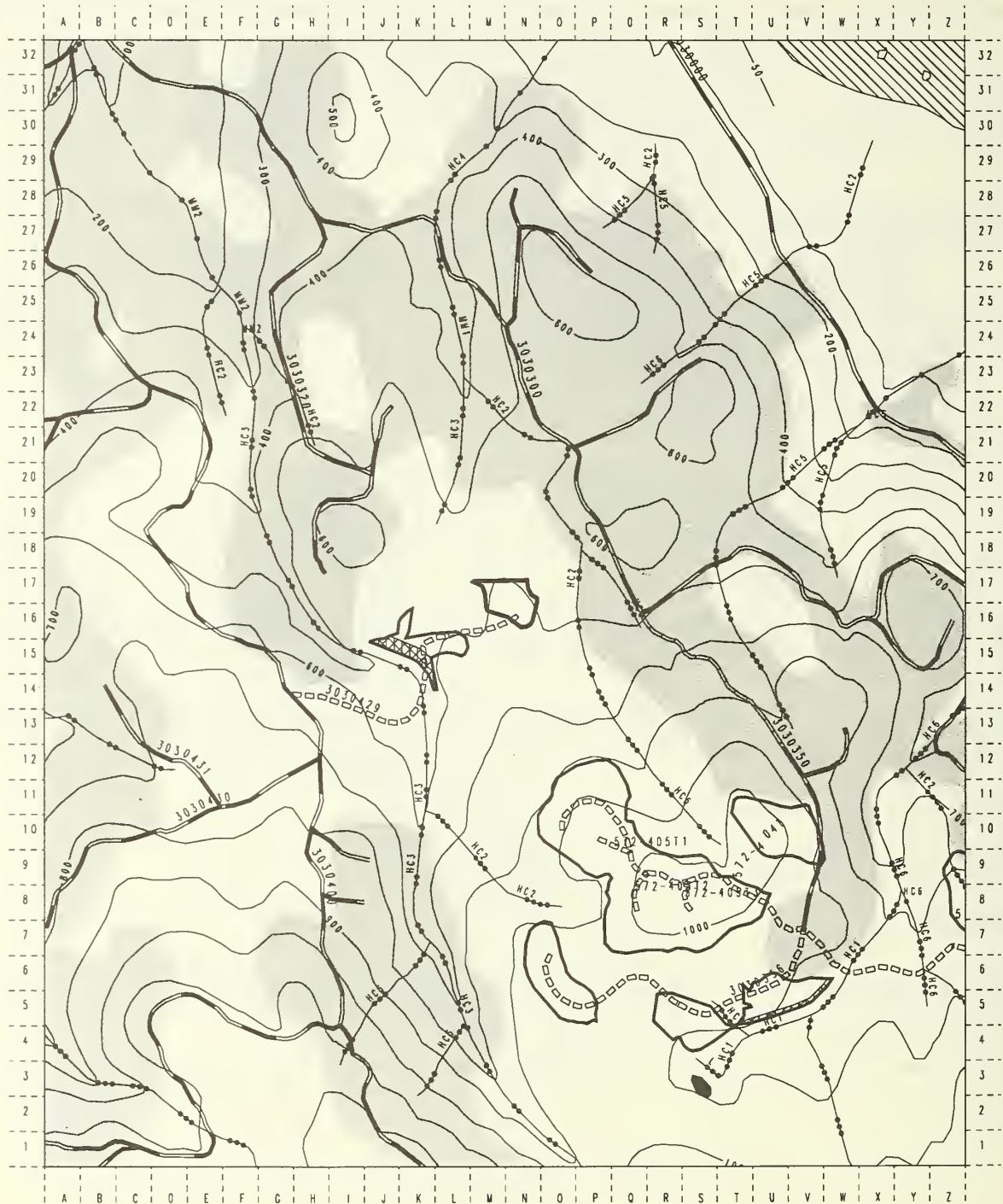
Geological Input: No concerns.

Silviculture Input: Stand exam summary: Unit has an average volume of 22 MBF/ acre, 27 TPA in the 21" size class, 98 TPA live with an average DBH of 19" and 47 TPA standing dead. Canopy closure is at 70%, cedar decline was noted. Partial harvest to meet S&G's feasible and recommend clear cut with reserves (4116) or partial overstory removal with IT/Group selection mix.

This unit as mapped is within a portion of stand 27 and has 15.876 MBF hemlock, 4.712 MBF yellowcedar and 1.502 MBF spruce for a total of 22.090 MBF per acre.

Luck Lake Project Area Draft Unit Card: **572-409 Acres= 3.73**

Mapscale 1:15840 (4 inch to Mile)



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|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-409	Planned Acres: 3.7	Estimated Volume: 29.8 MBF	In Alternatives: 3,4,6
Silvicultural System: 4114/4115, 4152	Number of Settings:	Quad: Craig D-3 NE	Photo: 1090-217
WAA Number: 1420			Logging systems: SH

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: W
Volume class breakdown:	Class 4: 4	Class 5:	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's: Modification		
Recreation:	Primary ROS Code		Roaded Modified			
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4-		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Mixed Conifer and cedar-hemlock-blueberry plant associations on poorly and somewhat poorly drained soils. Slopes less than 50 percent. Partial suspension cable yarding will meet soil and wetland resource objectives (BMP's 12.5 and 13.9). A portion of the unit is in the watershed used by the City of Coffman Cove for a water source. Special attention should be given to oil and hazardous substance spill prevention (BMP's 12.8 and 12.9). Unit is surrounded by non-forested and scrub-shrub evergreen wetlands. Riparian area below the slope-break will be entirely within the no-cut buffer.

Timber Input: Recommend shovel logging for this unit, may require field review by soil scientist prior to harvest.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: No fisheries or water quality concern with this unit. This unit is located within the Chum Creek watershed which is the community water source for Coffman Cove. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: NOGO surveys completed: 4/15/97. Implement marten and goshawk S&G's to retain => 30% canopy closure. High deer use noted. NOGO survey completed 7/16/98 and goshawk seen flying over area.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: Northern unit boundary located on state/private land boundary, survey will be required prior to harvest.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

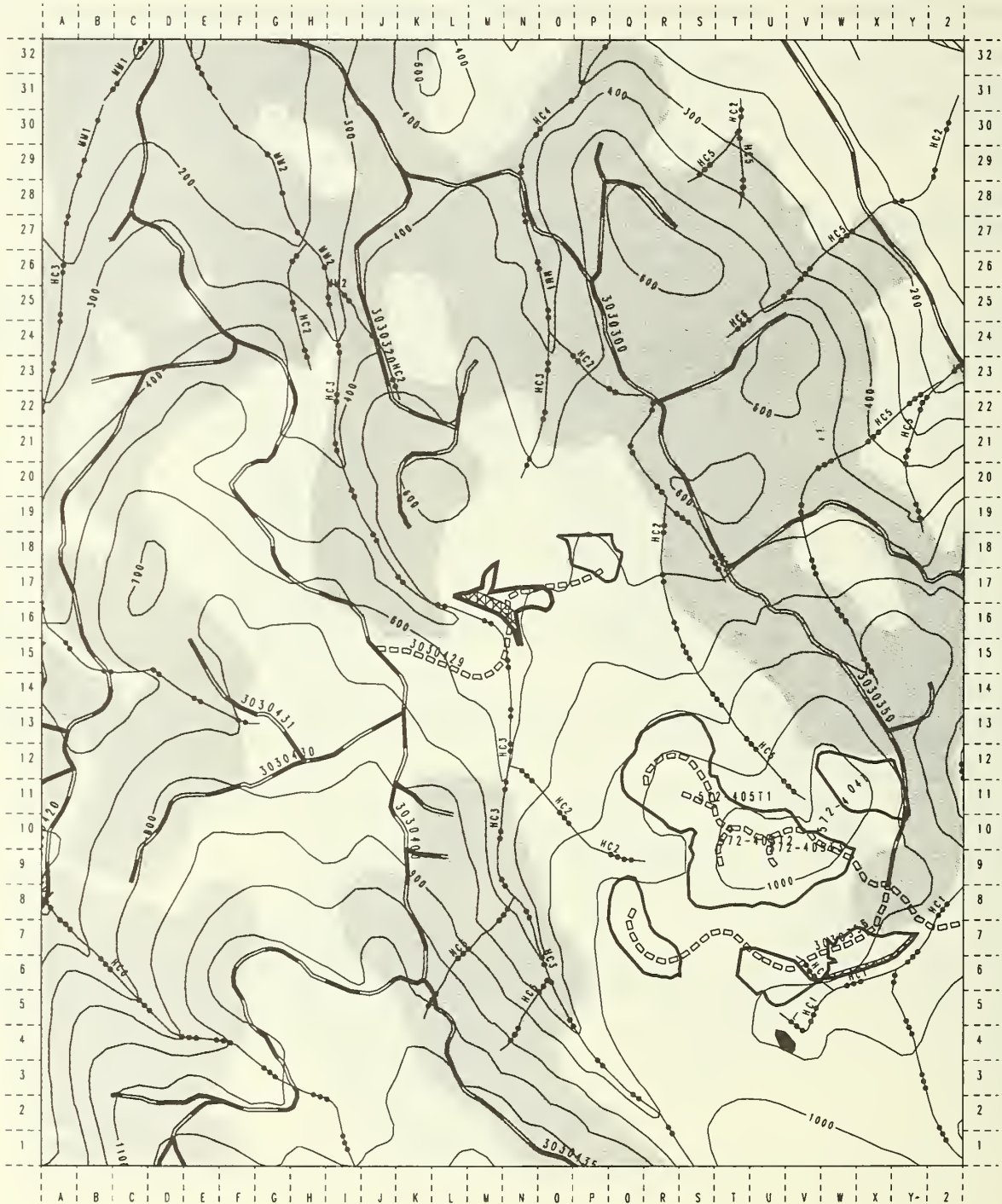
Geological Input: No concerns.

Silviculture Input: Stand exam summary: Unit has an average volume of 18 MBF/acre, with a canopy closure of 55%. There are 9 TPA in the 21" size class, 161 live TPA with an average DBH of 15" and 15 TPA standing dead. Recommend a patch cut or strip cut, as individual tree selection method may be marginal.

This unit as mapped, lies within a portion of stand 42 and has 5.314 MBF yellowcedar, 6.653 MBF hemlock and 8.828 MBF redcedar for a total of 20.795 MBF per acre.

Luck Lake Project Area Draft Unit Card: **572-410 Acres= 4.42**

Mapscale 1:15840 (4 inch 1 mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-410	Planned Acres: 4.4	Estimated Volume: 57.7 MBF	In Alternatives: 3,4,6
Silvicultural System: 4114/4115/4152, 4151	Number of Settings:	Quad: Craig D-3 NE Photo: 1090-217	Logging systems: RS
WAA Number: 1420			

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type: Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: W/NW
Volume class breakdown: Class 4: 1	Class 5: 3	Class 6:	Class 7:	Low Productive	
Scenery: Managed Viewshed: Alaska Marine Highway VQO's: Modification					
Recreation: Primary ROS Code Roaded Modified					
Riparian MA:	Class I Streams: 1	Class II Streams:	Class III Streams:	Class IV Streams:	
Soils:					
Mass movement Index: Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information: Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2-	3-4 4-
High Value Habitat: Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage forested wetland on slopes less than 50 percent. Partial suspension will meet soil and wetland resource objectives (BMP 12.5 and 13.9). One class II stream along the west unit boundary requires a buffer, see Fish/Watershed section (BMP 12.6, 12.6a, and 13.16). Unit 410 lies entirely within the watershed used by the City of Coffman cove as a water source. Special attention should be given to oil and hazardous substances spill prevention (BMP's 12.8 and 12.9).

Timber Input: Recommend small running skyline system to provide partial suspension of forested wetland soil types. Clump leave trees as much as possible to limit adverse impacts to logging feasibility.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class I, Blue/White, HC3 stream (mainstem Chum Creek) found along the west unit boundary requiring a 100 ft. no-cut buffer and reasonable assurance of windfirm buffer. No other streams were found in this unit. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: NOGO surveys completed: 4/15/97. Implement marten and goshawk S&G's to retain => 30% canopy closure. NOGO survey completed 7/16/98 and goshawk seen flying over area.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: Unit is located adjacent to state/private lands survey is required prior to harvest.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

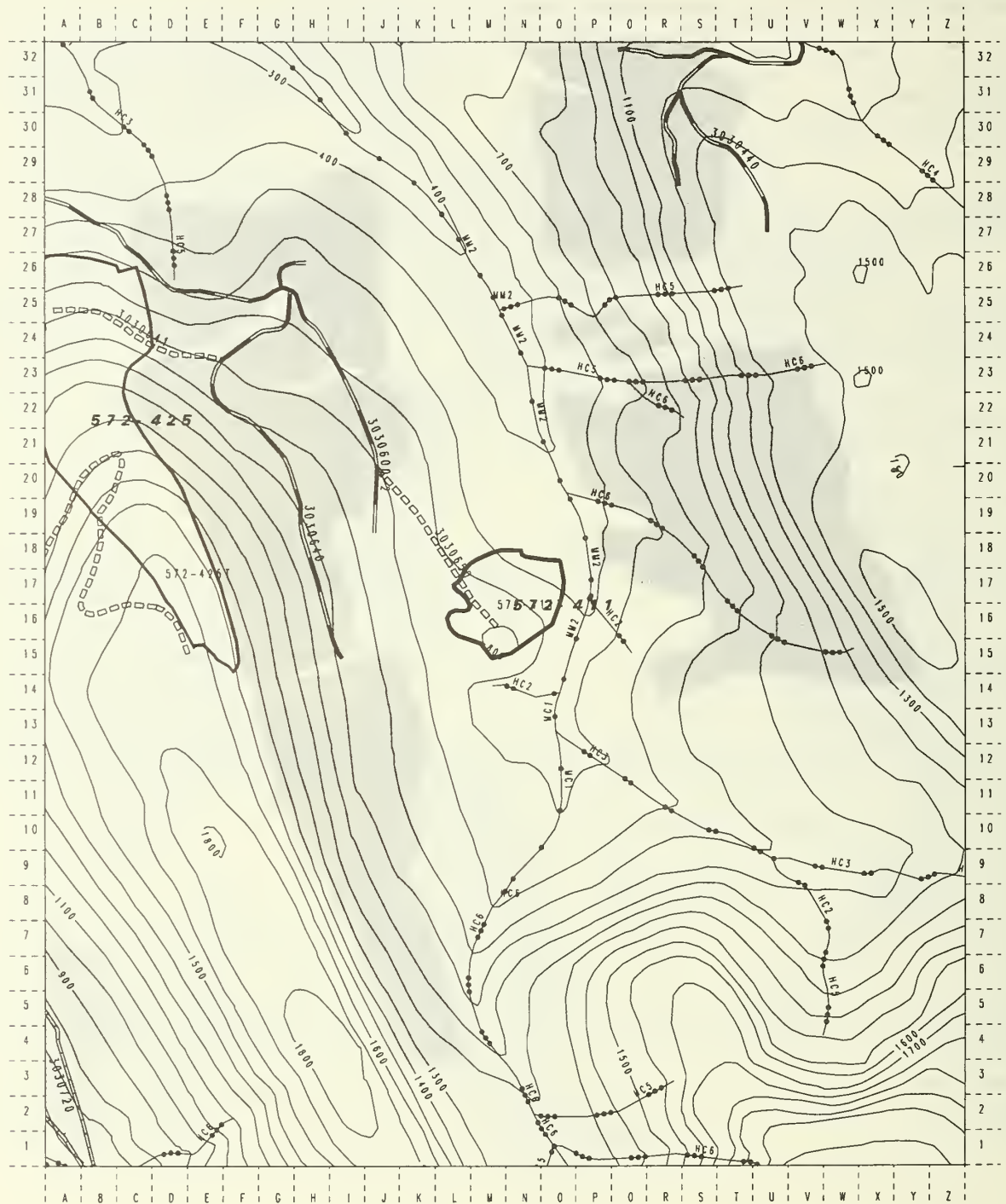
Geological Input: No concerns.

Silviculture Input: Stand exam summary: Unit has an average volume of 23 MBF/ acre, and a canopy closure of 70%. There are 25 TPA in the 21" size class, 110 TPA live with an average DBH of 19" and 36 TPA standing dead. Decays, cedar decline, defects, mistletoe and some fluting are concerns. Partial harvest is feasible using patch or strip clear cut with reserves to remove mistletoe infection centers (4114/4115/4152 and 4151 appropriate).

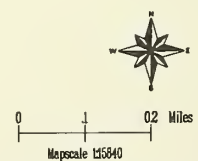
This unit as mapped, lies within a portion of stand 61 and has 11.238 MBF hemlock, 6.031 MBF redcedar and 6.656 MBF yellowcedar for a total of 23.925 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-411 Acres= 17.50

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Sallwater | Reconstruct Roads |
| | | Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-411	Planned Acres: 17.2	Estimated Volume: 285.9 MBF	In Alternatives: 4, 6
Silvicultural System: 4114, 4151/52	Number of Settings:	Quad: Craig D-3 NE	Photo: 690-157
WAA Number: 1420		Logging systems: RS/SH	

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4:		Class 5: 17	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Not Seen	VQO's:	Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams: 1	Class II Streams: 1	Class III Streams:	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 17 4-	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry and Cedar-hemlock-blueberry-skunk cabbage forested wetlands on 20 to 50 percent slopes. Most of the unit is wetlands with small areas of upland along the low ridges near Coffman Creek. Coffman Creek borders the east side of the unit. Partial suspension with limited areas of shovel yarding area possible while meeting resource objectives (BMP's 12.5 and 13.9). The Riparian area on Coffman Creek lies below the slope-break and is entirely within the no-cut buffer (BMP 12.6). See Fish/Watershed section for appropriate streamcourse protection (BMP's 12.6a and 13.16).

Timber Input: Recommend running skyline and shovel logging systems. Provide partial suspension over forested wetland soil types unless shovel logging is field reviewed prior to harvest by soil scientist. Retain leave trees in patches where possible.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class I, Blue/White, MM2 found along the east unit boundary requiring a 120 ft. no-cut buffer and reasonable assurance of a windfirm buffer. One Class II TTRA, Blue/White, HC2 found southeast of the south unit boundary requiring a 100 ft. no-cut buffer and reasonable assurance of a windfirm buffer. Apply BMP's 12.4, 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.6, 14.3, 14.5 and 14.7.

Wildlife Input: Moderate to high wildlife/riparian values associated with low volume transition zone to the west and riparian corridor to the east noted in silvicultural exam. NOGO surveys completed: 4/15/97, 4/16/98. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concerns as planned.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

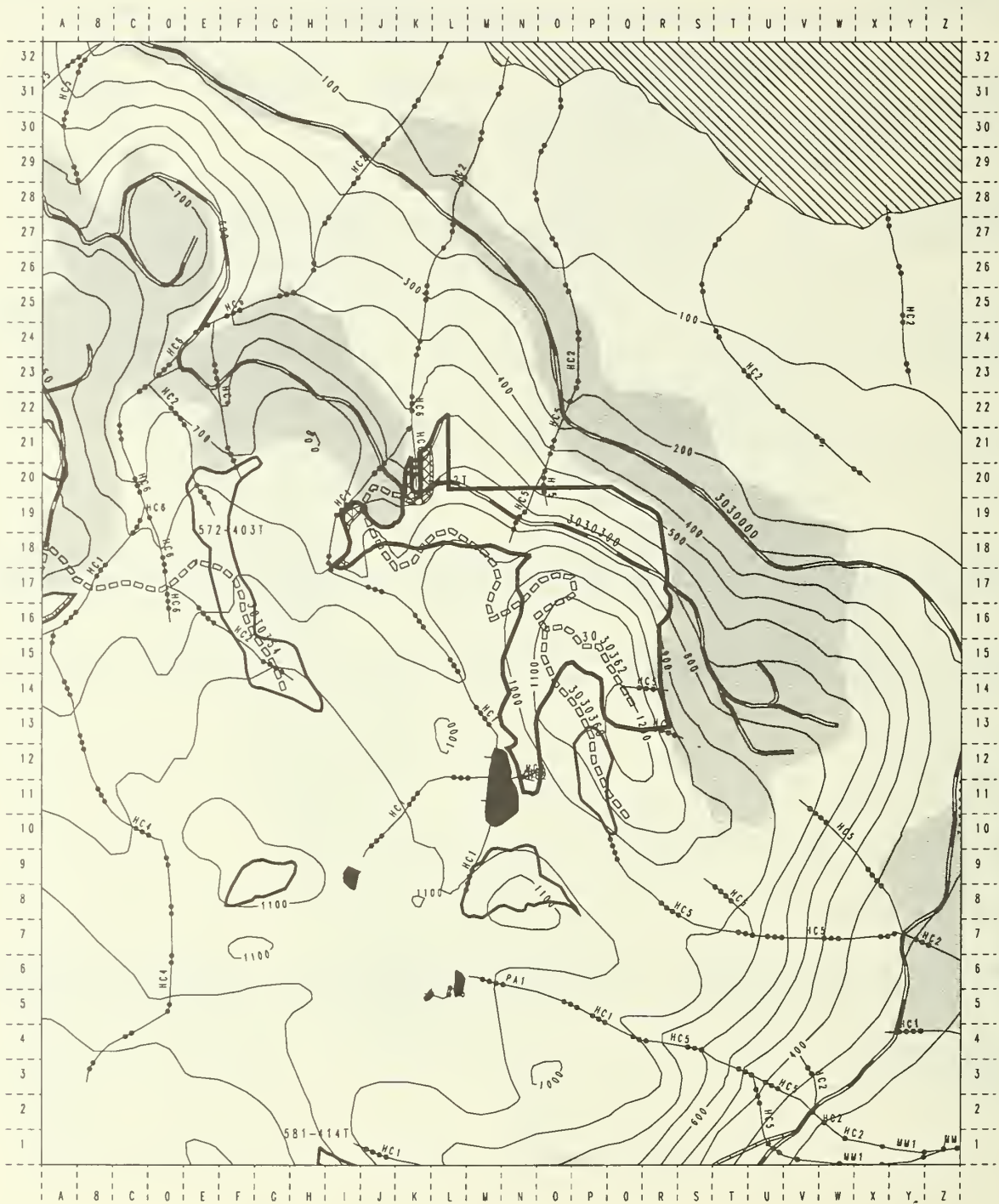
Geological Input: No concerns.

Silviculture Input: Stand exam summary: This unit has an average volume of 28 MBF/acre with an average canopy closure of 70%. There are 22 TPA in the 21" size class, 119 live TPA with an average DBH of 18", and 20 TPA standing dead. Partial harvest appears feasible with attention to mortality and infection centers. Recommend using patch cuts (4114) and selection mix (4151/52). Major concerns include decays, defect and deformities.

This unit falls within a portion of stand 28 (adjusted from mapping) and has 11.111 MBF hemlock, 5.302 MBF yellowcedar and 11.327 MBF spruce for a total of 17.740 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-412 Acres= 88.61

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



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Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-412 Planned Acres: 89.4 Estimated Volume: 1110.4 MBF In Alternatives: 3,4,5,6
 Silvicultural System : Mixed Number of Settings: Quad: Craig D-3 NE Photo: 1090-102 Logging systems: S
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4:	Class 5:	89	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed:	Alaska Marine Highway	VQO's:	Modification		
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	1	Class IV Streams:	8
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1-	2- 40 3- 49 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage forested wetland stands in the southern portion of the unit. Upland soils shallow to bedrock cover approximately 70 percent of unit 412. See the soils reconnaissance report in the soil and wetland resource report. Minor areas of Kitkun soils in small swales in the southwestern corner of the unit. There are approximately 8 acres on slopes over 72 percent, five acres of which should be deleted or a very selective ITM harvest implemented which would minimize the chance for windthrow while maintaining root strength (BMP 13.5). A small landslide was noted in the blowdown in this area. Partial suspension is required across the rest of the unit (BMP 13.9). There are opportunities for shovel yarding on about 3 acres (BMP 13.9). The stream draining the small lake west of the unit has a small V-notch riparian area that is entirely within the buffer. A narrow lakeshore fen forms the riparian area around the lake. See Fish/Watershed section for lake and streamcourse protection (BMP 12.6a and 13.16). Windthrow of retention trees is a concern in the northeast corner of unit 412.

Timber Input: Recommend skyline with lateral yarding capabilities. Partial suspension is required over the majority of the unit. Recommend corridor logging to meet martin and goshawk standards and guidelines.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, Orange/White, HC1 found along the northwest tip of the unit requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Two Class IV, Green/White, HC5 channels found flowing out of the north end of the unit. Two Class IV, Green/White, HC5 channels found in the southeast corner of the unit. One Class IV, Green/White, HC1 found along the southwest unit boundary flowing out of the lake. Three connected Class IV, Green/White, HC2 channels found in the south tip of the unit flowing into the lake. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate to high wildlife use noted during silvicultural exam. NOGO surveys completed: 4/07/97, 4/18/97, 7/14/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit located in middle ground low VAC, existing visual condition does not meet visual quality objective, partial cutting required to meet VQO. Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent impacts created by State of Alaska harvest push viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: Northern unit boundary is located on state/private boundary survey required prior to harvest.

Cultural Resource Input: Unit outside of high probability area for cultural resources.

Geological Input: No concerns.

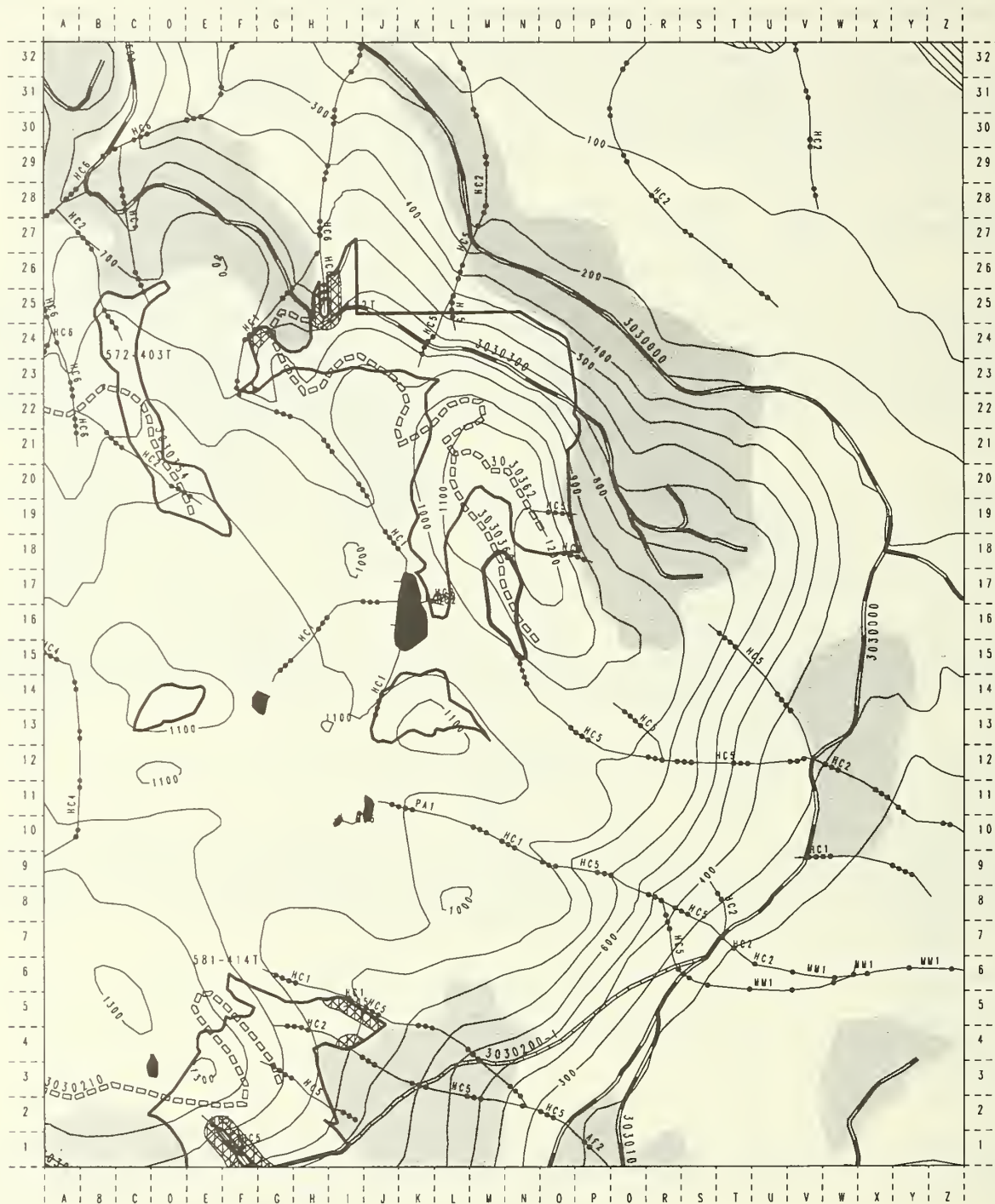
Silviculture Input: Three stands involved with similar conditions. Hemlock and hemlock-yellowcedar with some spruce and scattered redcedar occur. Average conditions have about 80 TPA with Dq=22" and about 10 TPA dead. About 24 TPA occur in the 21"+ DBH class. Decays, defect, cedar decline and patchy wind damage are concerns. Average crown closure is 65-70%. Partial harvest is feasible using a mixture of methods by site. Use group selection (4152) where windthrow risk is high. Clear cut with reserves (4116) or partial overstory removal (4145) may be most appropriate for the majority of the treatment area.

This unit, as mapped involves the following stands:

41 acres in stand 11 has 13.332 MBF hemlock, 7.341 MBF spruce and 5.091 MBF yellowcedar for a total of 25.764 MBF per acre.
 32 acres in stand 13 has 4.886 MBF yellowcedar, 13.308 MBF hemlock and 3.574 MBF spruce for a total of 23.431 MBF per acre.
 10 acres in stand 62 has 1.205 MBF yellowcedar, 21.227 MBF hemlock and 1.009 MBF redcedar for a total of 23.441 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-413 Acres= 5.22

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



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Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-413 Planned Acres: 5.2 Estimated Volume: 102 MBF In Alternatives: 4,5,6
 Silvicultural System : 4114/152, 4145 Number of Settings: Quad: Craig D-3 NE Photo: 1090-102 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect:
Volume class breakdown:	Class 4:	Class 5:	Class 6: 5	Class 7:	Low Productive	
Scenery: Managed Viewshed:	Not Seen	VQO's:	Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 5 4-		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage and cedar-hemlock-blueberry forested wetland and upland soil complex on shallow poorly drained soils. Minor areas of Kitkun soils in the unit. See Soil Resources report. Slopes range up to 55 percent. Partial suspension will meet resource objectives for soils and wetlands (BMP 12.5 and 13.9). A short sedge fen lies downslope of the unit.

Timber Input: Recommend small running skyline with lateral yarding capabilities. Partial suspension is required.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Fisheries recon found no streams in this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Heavy wildlife use noted during silvicultural exam. NOGO surveys completed: 4/18/97, 7/14/97. Implement marten and goshawk S&G's to retain => 30% canopy closure

Recreation/Scenery Input: Unit is screened by adjacent slopes; no concerns. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

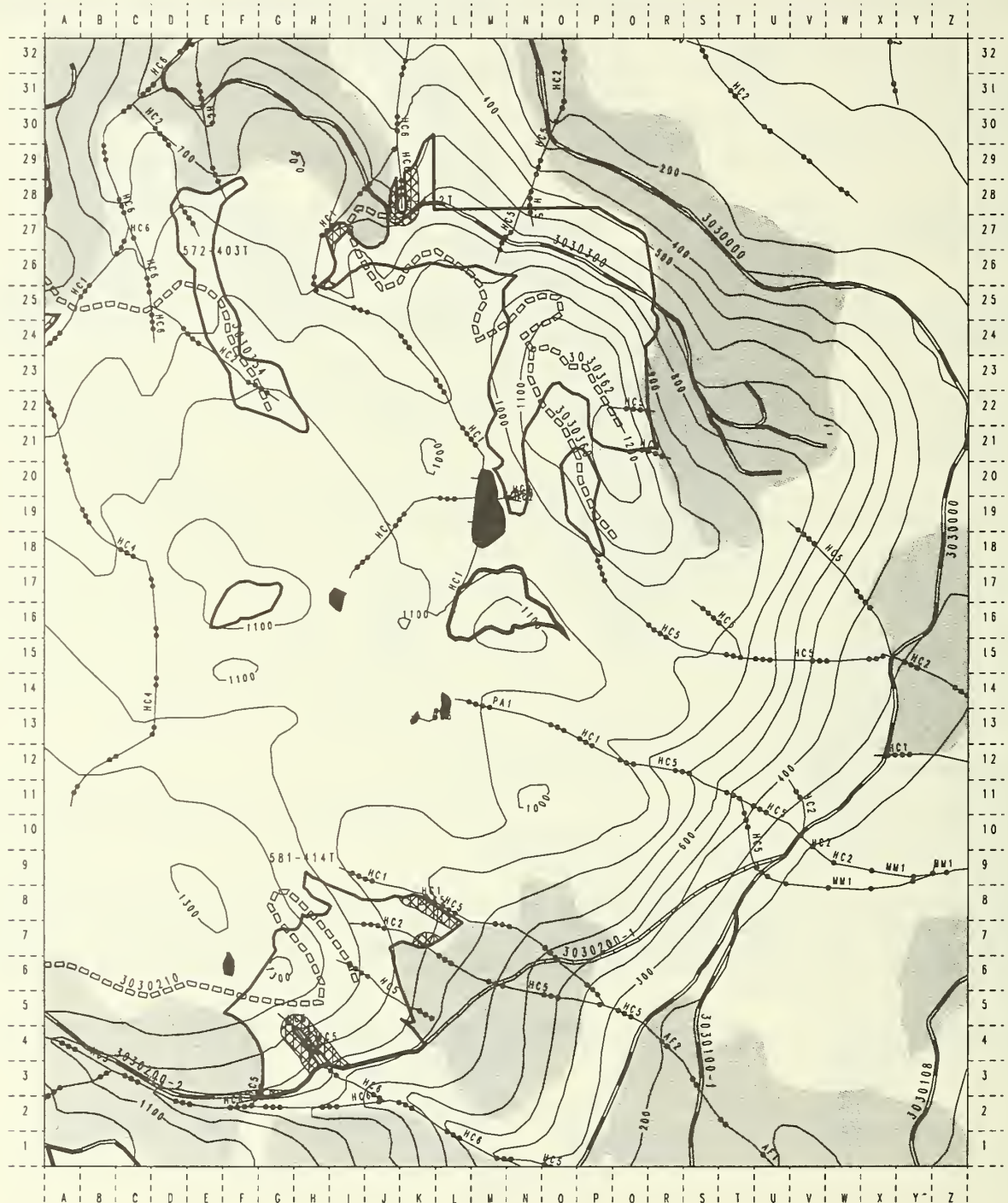
Geological Input: A small area of karst was identified on the end of the ridge west of the cliffs. The epikarst was developed to a depth of one to three feet and the karst appeared to be less than ten feet thick. Low to moderate vulnerability.

Silviculture Input: Steams and muskeg to the west and low volume forest to the E and S. Mostly hemlock-yellowcedar/spruce, this stand is well stocked with 114 TPA having Dq=20" and 16 TPA dead. 45 TPA occur in the 21"+ DBH class. Decays, defect and patchy wind damage are concerns. Wind damage occurs mostly along edges and in S portion of planned unit. Some mistletoe also occurs. Partial harvest is feasible using most methods with caution to remove mistletoe centers. Recommend using partial overstory removal in majority of stand with group selection/patch clear cut for wind prone areas and mistletoe centers (4152/4114). Crown closure averages 60%.

This unit lies within stand 15 and has 11.661 MBF hemlock, 8.501 MBF yellowcedar and 12.776 MBF spruce for a total of 32.938 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-414 Acres= 9.62

Mapscale 1:15840 (4 inch to Mile)



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|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-414 Planned Acres: 9.6 Estimated Volume: 103 MBF In Alternatives: 4, 6
 Silvicultural System : 4116/114/152 Number of Settings: Quad: Craig D-3 NE Photo: 1090-102 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: All
Volume class breakdown:	Class 4: 10		Class 5:	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Alaska Marine Highway		VQO's: Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 5 4- 5		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry and cedar-hemlock-blueberry-skunk cabbage plant associations. Forested wetland and upland complex. Slopes up to 55 percent. Partial suspension will meet resource protection needs for soils and wetlands (BMP 12.5 and 13.9). A short sedge fen lies downslope of the unit. See Fish/Watershed section for streamcourse protection requirements (BMP 13.16).

Timber Input: This unit will be logged using a helicopter logging method; all resource mitigation will be met.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV, Green/White, HC2 found just outside the northwest unit boundary flowing into the lake. Apply BMP's 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate to high wildlife use indicated by trail and browse abundance noted during silvicultural exam. Swan heard in lake to the N. (same day as observations from unit 417 - NOT a second observation). NOGO surveys completed: 4/18/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: The south part of this stand is mostly mountain hemlock-yellowcedar with poor volume and stand conditions. Recommend either clear cut or salvage/sanitation to remove decline in cedar and regenerate this portion of the stand. The northern portion of the stand has better timber and conditions (but not much better). Canopy closure ranges from 10% at the south end to 55% at the north end which leaves little room to meet crown retention S&G's. Diameter distribution does not favor retention of larger size trees and recovery of economic volume using methods other than clear cut or group selection. 142 TPA with Dq=17" and 56 TPA dead occur on average. 29 TPA occur in the 21"+ DBH class. Decays, cedar decline, defects and wind damage are of concern. Partial harvest is feasible using clear cut methods (4114/115) or group selection (4152).

This stand lies within stand 17 and has 1.828 MBF spruce, 6.944 MBF yellowcedar and 10.459 MBF for a total of 19.231 MBF per acre.

Luck Lake Project Area Draft Unit Card: **572-417 Acres= 3.97**

Mopscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Soilwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



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Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-417 **Planned Acres:** 4 **Estimated Volume:** 73.4 MBF **In Alternatives:** 4,6
Silvicultural System : 4145 **Number of Settings:** **Quad:** Craig D-3 NE **Photo:** 1090-102 **Logging systems:** RS
WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type: Cedar X Hemlock X Spruce Mixed Hem/Spr Nonforested **Aspect:** Rolling
Volume class breakdown: Class 4: Class 5: Class 6: 4 Class 7: **Low Productive**
Scenery: Managed Viewshed: Alaska Marine Highway **VQO's:** Modification
Recreation: Primary ROS Code Roaded Modified
Riparian MA: Class I Streams: Class II Streams: Class III Streams: Class IV Streams:
Soils:
Mass movement Index: Low Medium High Very High Unknown **Slopes Greater Than 72%**
Wetland Information: Wetland Mix Wetland Riparian Soil **Site Productivity Classes** 1- 2- 3- 4 4-
High Value Habitat: Sitka Black-Tail Deer- Marten- River Otter- Bald Eagle- Black Bear-
 Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage and cedar-hemlock-blueberry Forested wetlands and upland complex on slopes less than 50 percent gradient. Partial suspension will meet resource protection requirements (BMP 12.5 and 13.9). Short sedge fens surround unit 417.

Timber Input: Recommend expanding unit to include the majority of the timber type stand.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Fisheries recon found no streams in this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Heavy browse and trails noted along with one swan in lake to the NE during silvicultural exam. NOGO surveys completed: 4/18/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

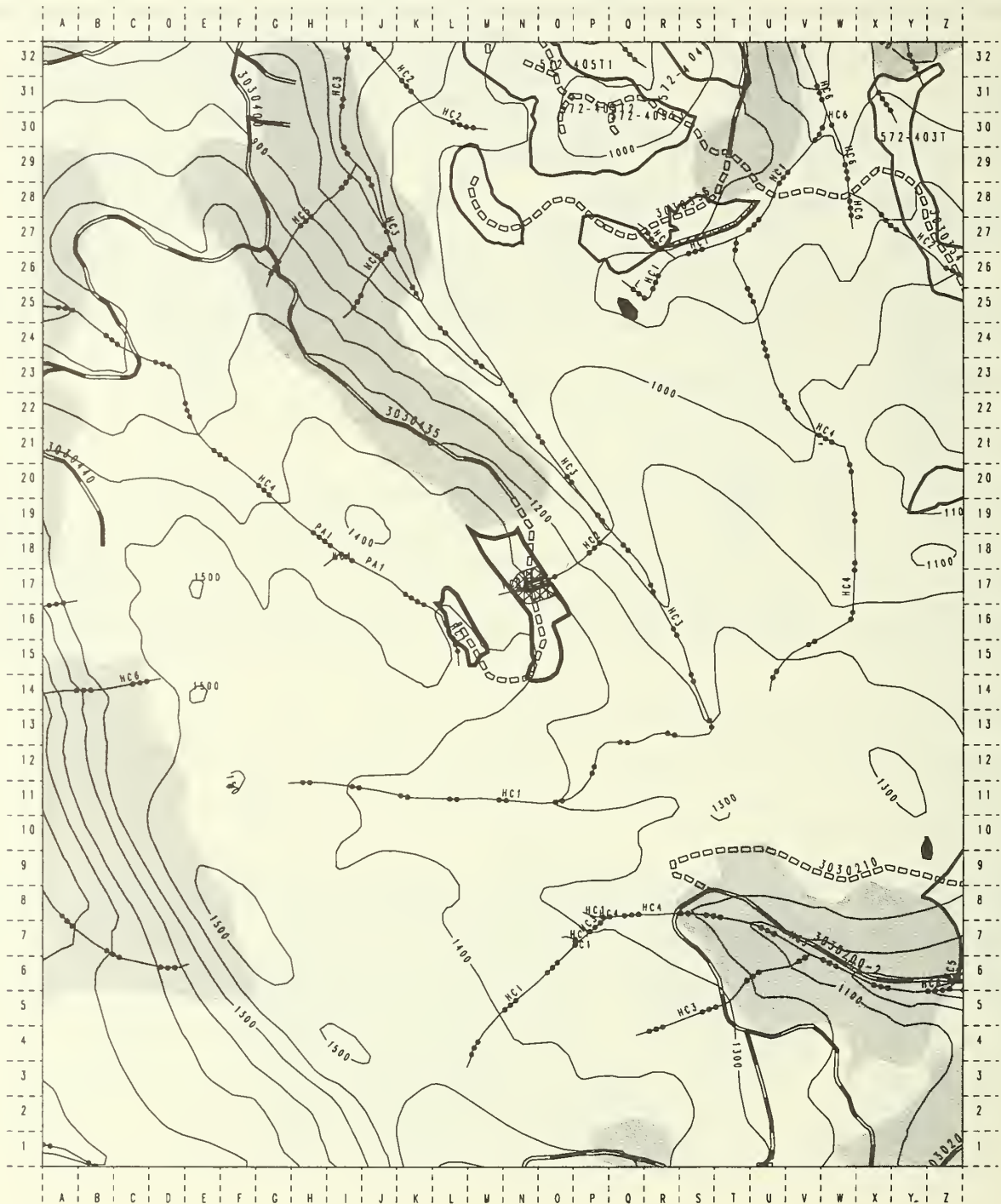
Geological Input: No concerns.

Silviculture Input: Mostly hemlock-yellowcedar with a small spruce component, this stand has 130 TPA with Dq=20" and about 12 TPA dead. There are 47 TPA in the 21"+ DBH class. Decays, defect, brooms and some fluting occur. Average crown closure is 65-70%. All silvicultural systems may be suitable for this site but partial overstory removal may best accomplish objectives and meet S&G's. Target broomed and wolfy trees for retention where available and not mistletoe infected. No reason not to expand unit to include majority of timber type (up to 16 acres available).

This unit lies within stand 20 and has 26.301 MBF hemlock, 1.683 MBF spruce and 7.127 MBF yellowcedar for a total of 35.111 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-420 Acres= 13.58

Mapscale 1:15840 (4 inch to Mile)



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|-----------|----------------|---|-----------------|---------|---------------------|
| —●— | Class 1 stream | □ | Second-growth | — | Unit Boundary |
| - - -●- | Class 2 stream | ▨ | Windfirm Buffer | — | Other unit boundary |
| | Class 3 stream | ■ | Freshwater | — | Existing Roads |
| - · - · - | Class 4 stream | ▤ | Saltwater | — | Reconstruct Roads |
| | | | | □ □ □ □ | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-420 Planned Acres: 14 Estimated Volume: 143.6 MBF In Alternatives: 2,3,4,6
 Silvicultural System : 4114/4115 Number of Settings: Quad: Craig D-3 NE Photo: 1090-215 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NW/Varied
Volume class breakdown:	Class 4:	Class 5: 6	Class 6: 3	Class 7:	Class 7:	Low Productive
Scenery:	Alaska Marine Highway	VQO's: Modification				
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2-	3- 4- 7 5- 2
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage forested wetlands on slopes less than 50 percent gradient. Short sedge fen downslope. Partial suspension will meet resource protection for wetlands and soils (BMP's 12.5 and 13.9). Entire unit lies within the watershed used by the City of Coffman Cove. Give special attention to oil and hazardous substance spill prevention (BMP's 12.8 and 12.9). See Fish/Watershed section for streamcourse protection (BMP's 12.6a and 13.16).

Timber Input: Potential for additional harvest along road route from original configuration. Recommend running skyline logging system.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV, G/W, HC1 stream found that bisects the proposed unit addition and becomes a Class III, O/W, HC2 as the stream exits the unit. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. Wolves heard NW of proposed unit. NOGO surveys completed: 4/15/97, 7/8/98. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Proposed unit is in three parts (including addition to original configuration). Clockwise from N: 116 TPA with Dq=19" and 32 TPA dead occur in about 3 acres and there are 26 TPA in the 21"+ DBH class. Hemlock-yellowcedar dominate and stem decays, physical defect and cedar decline are concerns. Another 3 acres to the S holds mostly hemlock-spruce-yellowcedar having only 56 TPA with Dq=22" and 29 TPA dead. There are 25 TPA in the 21"+ DBH class and stem decays, physical defect and cedar decline are concerns. About 3 acres to the W is mostly hemlock-yellowcedar, 144 TPA with Dq=19" and 60 TPA dead. There are 33 TPA in the 21"+ DBH class and decays, defect and cedar decline are concerns. Regeneration objectives include maintaining spruce and cedar components. Partial harvest is feasible but patch or strip clear cuts with some reserve would best suit to meet S&G's.

This unit, as mapped, has three parts in three separate stands.

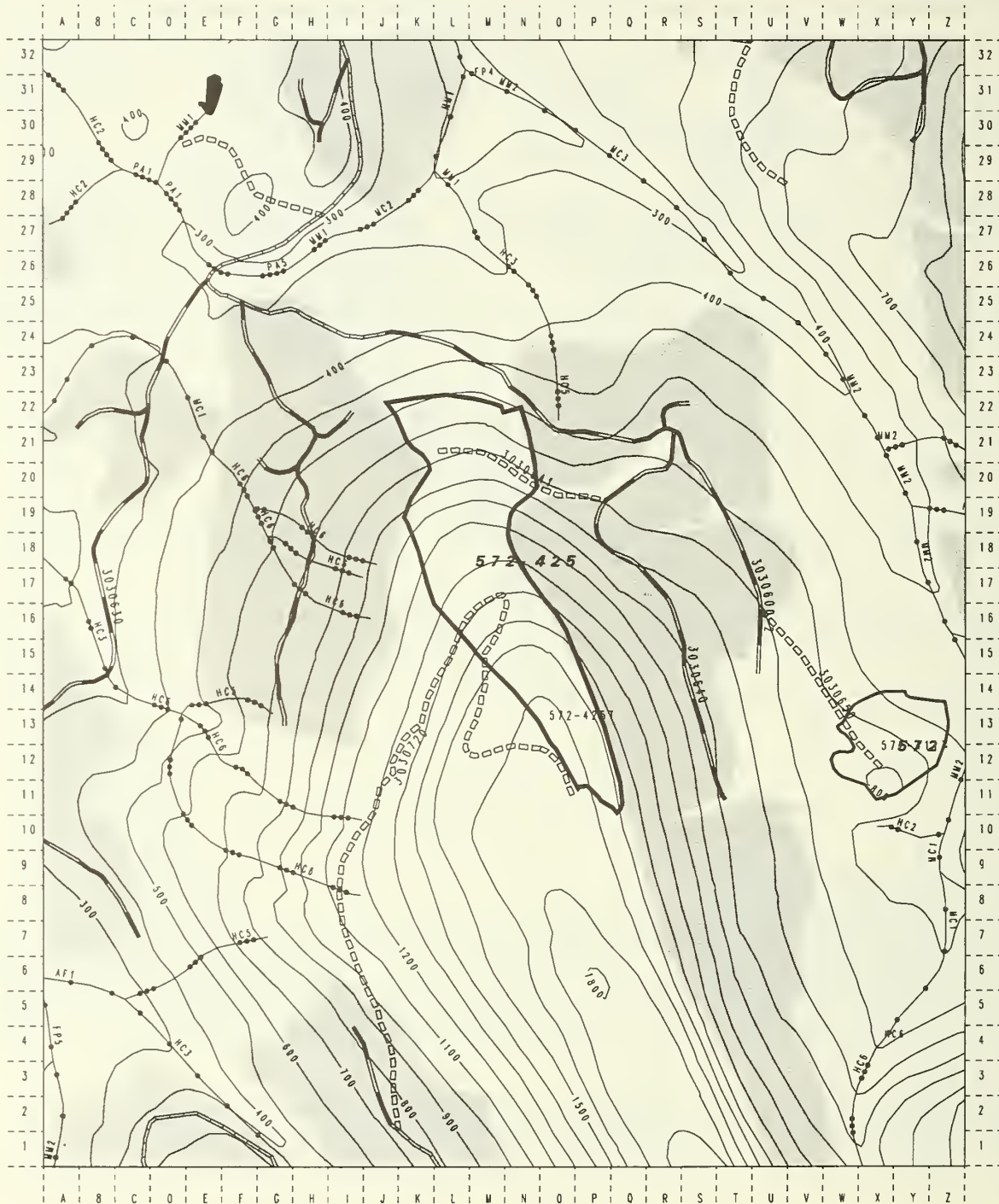
Stand 36, 2 acres, has 16.872 MBF yellowcedar, 2.799 MBF hemlock and 2.226 MBF spruce for a total of 21.898 MBF per acre.

Stand 50, 3 acres, has 10.362 MBF yellowcedar, 18.355 MBF hemlock and 2.251 MBF spruce for a total of 30.967 MBF per acre.

Stand 51, 4 acres, has 7.629 MBF hemlock, 5.695 MBF spruce and 0.908 MBF yellowcedar for a total of 14.232 MBF per acre.

Luck Lake Project Area Draft Unit Card: 572-425 Acres= 74.68

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--------|----------------|---|-----------------|------|---------------------|
| —●— | Class 1 stream | □ | Second-growth | — | Unit Boundary |
| —●●— | Class 2 stream | ▨ | Windfirm Buffer | — | Other unit boundary |
| —●●●— | Class 3 stream | ■ | Freshwater | — | Existing Roads |
| —●●●●— | Class 4 stream | ▩ | Sollwater | — | Reconstruct Roads |
| | | | | □□□□ | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 572-425 Planned Acres: 74.8 Estimated Volume: 1353 MBF In Alternatives: 3,4,6
 Silvicultural System : 4116/114/151/152/145 Number of Settings: Quad: Craig D-3 NW Photo: 690-158 Logging systems: S
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: N
Volume class breakdown:	Class 4: 5		Class 5:	Class 6: 29	Class 7: 41	Low Productive
Scenery:	Managed Viewshed: Coffman Cove/Alaska Marine Highway				VQO: Modification	
Recreation:	Primary ROS Code		Roaded Modified			
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:	8	
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 66	3- 9 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-spruce-blueberry, hemlock-blueberry, and cedar-hemlock-blueberry-skunk cabbage plant associations within the unit. Minor areas of poorly drained Kitkun and St. Nicholas soils supporting forested wetlands near the non-forested bog on the ridgetop. Unit is mostly well drained uplands. There is about one acre on slopes over 72 percent. Partial suspension is required to meet soil resource protection needs (BMP 12.5, 13.5 and 13.9). Several water quality streams occur in the unit with very small riparian areas below the slope-break on these streams in the northwest corner of the unit. The riparian area is entirely within the slope-break buffer (BMP 12.6, 12.6a and 13.16).

Timber Input: Add treatment acreage to the N and include wind damage along past harvest boundaries. Recommend skyline logging system with lateral yarding capabilities.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Recon found four Class IV, Green/White, HC5 channels in the southeast corner of the unit (two inside, two outside the unit). Two Class IV, Orange/White, HC5 channels were found in the northwest corner of the unit requiring O/W protection. Two Class IV, Green/White, HC5 channels found in the northwest corner of the unit. The proposed north unit addition was not reconned by fisheries. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12, and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: Trails and sign noted throughout the area with moderate indications of use noted during silvicultural exam. NOGO surveys completed: 4/15/97, 4/16/98. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit is visible from Coffman Cove and Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to the unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

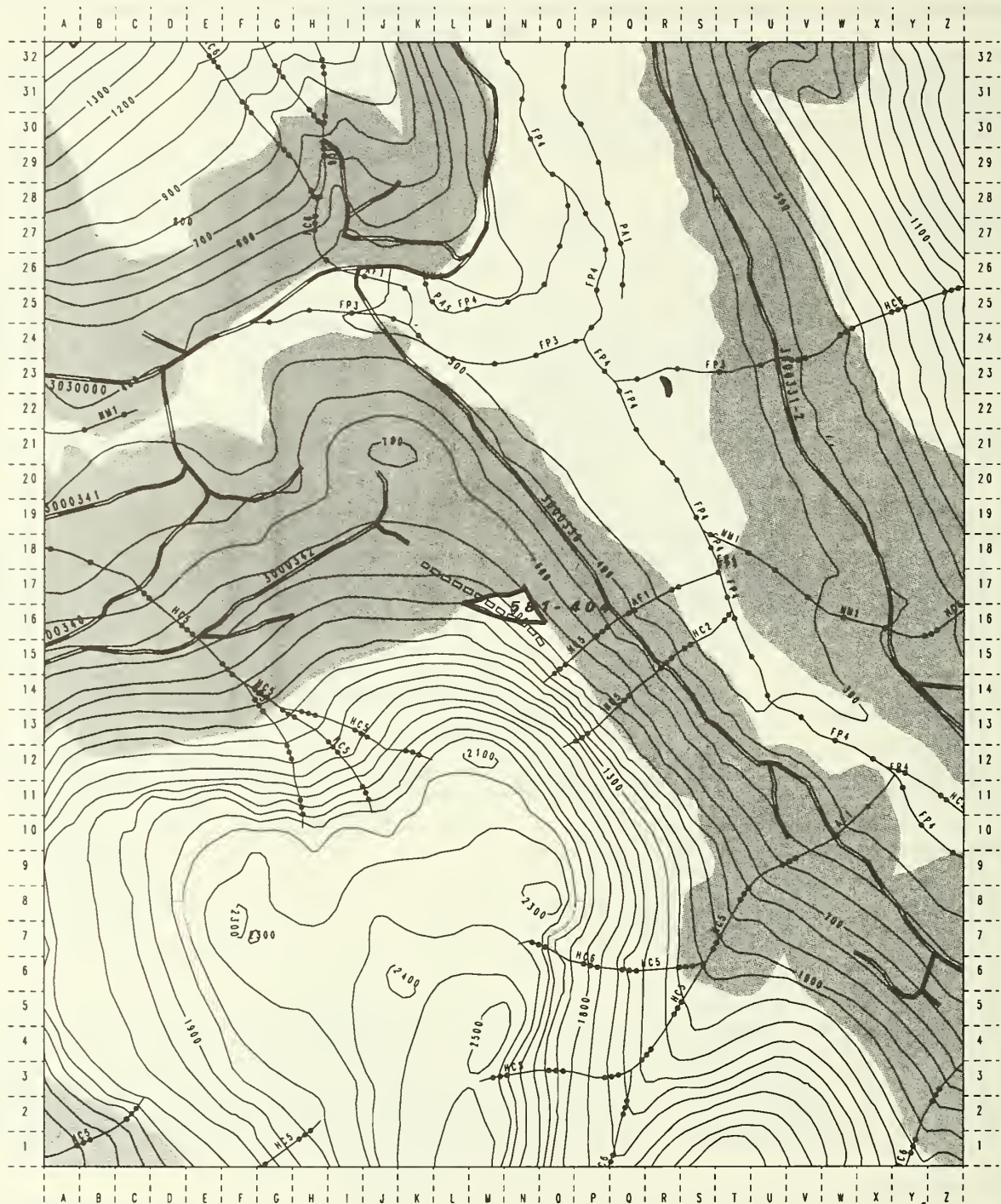
Geological Input: No concerns.

Silviculture Input: Recommend expanding treatment to existing road to the N. Moderate volume occurs in stand 9 at the S end of the treatment unit. 145 TPA with Dq=17" and 21 TPA dead occur. 24 TPA are present in the 21"+ DBH class and crown closure is about 70%. Stem decays, physical defect, moderate mistletoe and windthrow is evident. Composition is Hemlock-spruce with advance regeneration including yellowcedar and M. hemlock. This area is a candidate for overstory removal. Most of the remainder of the proposed treatment area is high volume (VC 6&7). Between 73 and 108 TPA with Dq=21-22" and 12-18 TPA dead occur. There are between 29 and 35 TPA in the 21"+ DBH class. Crown closure is between 55 and 65% due to windthrow and stand decadence. Decays, defects, mistletoe, light fluting and windthrow are concerns. Composition is hemlock-redcedar with varying amounts of spruce. Partial harvest is feasible with cautions for wind and mistletoe. Combination of clear cut with reserves and selection harvest methods are most appropriate to meet S&G's.

This unit, as mapped has two stands and may be expanded to include all or a portion of a third stand.
 Stand 9, 5 acres, has 14.769 MBF hemlock and 5.169 MBF spruce for a total of 19.938 MBF per acre. There may be some additional volume in yellowcedar.
 Stand 10, 40 acres (plus new expansion) has 34.027 MBF hemlock, 14.401 MBF spruce and 1.381 MBF redcedar for a total of 49.808 MBF per acre.
 Possible expansion into stand 114, 12 acres total, would have 18.494 MBF hemlock, 0.946 MBF spruce and 7.611 MBF redcedar for a total of 31.708 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-404 Acres= 2.91**

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Recanstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Unit: 581-404 Planned Acres: 2.9 Estimated Volume: 42 MBF In Alternatives: 4,6
 Silvicultural System : 4151/2 Number of Settings: Quad: Craig D-3 SE Photo: 1090-206 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar	Hemlock	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4:	Class 5: 3	Class 6:	Class 7:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Not Seen	VQO's: Maximum Modification				
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:	1	
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 3	3- 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-spruce-blueberry stands on slopes less than 50 percent. Reconnaissance eliminated landslide prone slopes. Soils are well drained and deep. Slopes are less than 50 percent. Partial suspension will meet soil resource protection needs (BMP 13.9, 13.2 and 13.5). An avalanche area riparian area occurs along the south boundary stream and is entirely within the stream buffer (BMP 12.6). See Fish and Watershed for streamcourse protection measures (BMP 12.6a and 13.16).

Timber Input: Recommend helicopter logging due to difficult road building for minimal volume.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV, O/W, HC5 stream found along the south unit boundary requiring O/W protection. Fisheries recon found no other streams in this unit. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: Minimal indications of wildlife use other than trails noted during silvicultural exam. NOGO surveys completed: 4/07/97. Implement marten and goshawk S&G's to retain => 30% canopy closure

Recreation/Scenery Input: No concerns as planned. No established recreation use

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

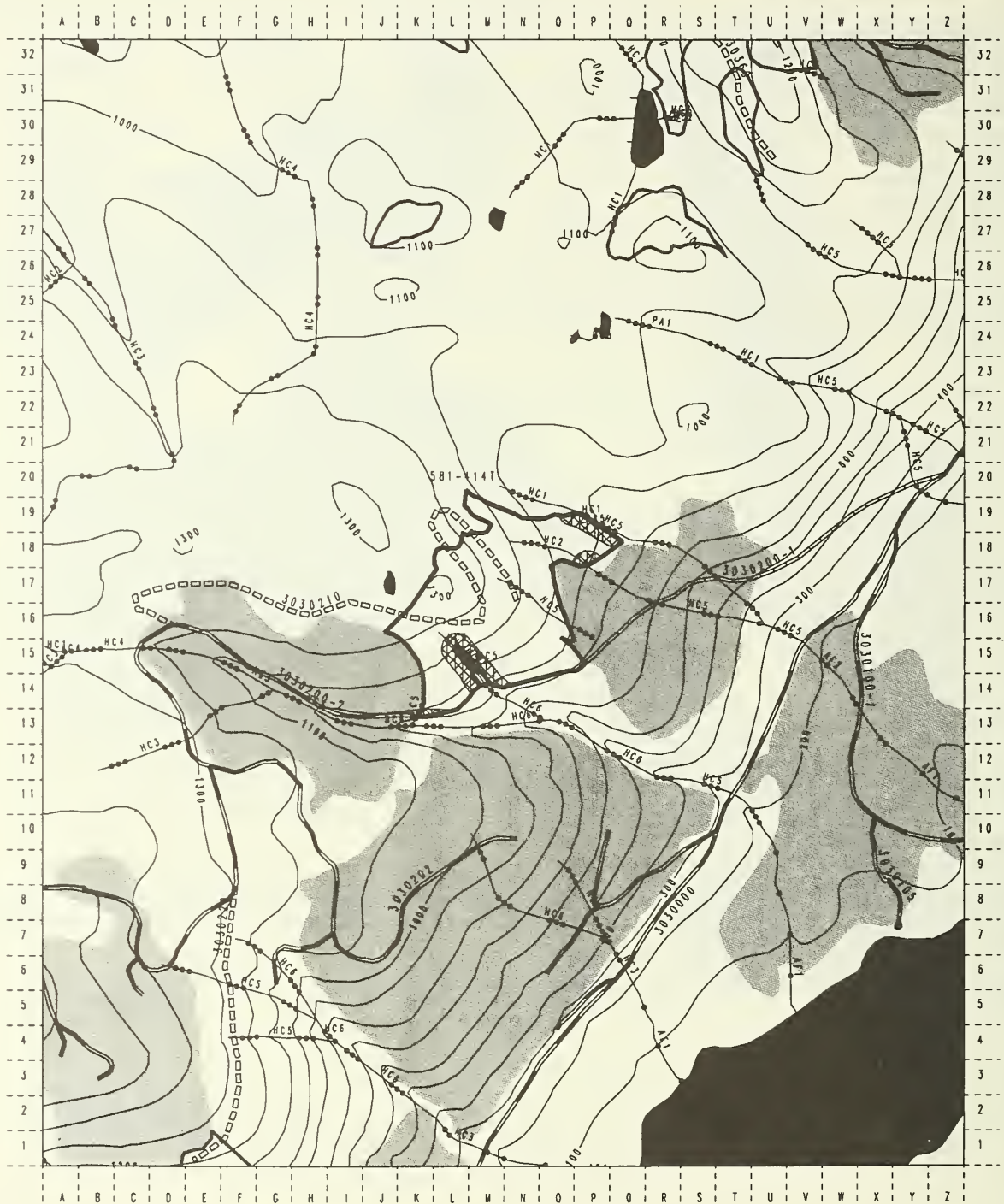
Geological Input: No concerns.

Silviculture Input: Exams show moderate to light stocking in Hemlock-spruce. 25 TPA with Dq=29" and 0.5 TPA dead. 17 TPA occur in the 21"+ DBH class. Average canopy closure is 60% and windthrow is noted as a high concern. Defect and stem decay also present. Partial harvest feasible using selection methods with caution for windthrow potentials.

As mapped, the unit lies within stand 62 and has 19.392 MBF spruce and 10.106 MBF hemlock for a total of 29.498 MBF per acre.

Luck Lake Project Area Draft Unit Card: 581-414 Acres= 52.84

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|--------------------|-------------------|-----------------------|
| —●— Class 1 stream | □ Second-growth | — Unit Boundary |
| —●— Class 2 stream | ▨ Windfirm Buffer | — Other unit boundary |
| —●— Class 3 stream | ■ Freshwater | — Existing Roads |
| —●— Class 4 stream | ▨ Saltwater | — Reconstruct Roads |
| | | □ Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-414 Planned Acres: 53.4 Estimated Volume: 865 MBF In Alternatives: 3,4,5,6
 Silvicultural System : 4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-102 Logging systems: RS/SH
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr X	Nonforested	Aspect: E-SE
Volume class breakdown:	Class 4: 9	Class 5: 27	Class 6: 17	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Luck Lake Boat Launch/Alaska Marine Highway				VQO's: Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams: 5		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 17	3- 36 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and Cedar-hemlock-blueberry plant stands on slopes less than 70 percent. Average slope is about 35 percent. Minor areas of cedar-hemlock-blueberry-skunk cabbage forested wetlands occur along the northern fringe of the unit. Partial suspension with cable systems and minor amounts of shovel yarding will meet resource protection needs (BMP 13.9 and 12.5). A small riparian area occurs below the slope-break on one water quality stream. The riparian area is entirely within the buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection needs (BMP 12.6a & 13.16).

Timber Input: Northern finger of original configuration is non-CFL. Add timbered lands to SE and abut harvested stand 517. Recommend shovel swing logging system with patches of harvest (shovel) on the benches with corridors to the road running skyline swing. This harvest method will meet martin and goshawk standards and guidelines while maintaining scenic integrity.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input One Class III, O/W, HC3 stream found along the northeast unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class III, O/W, HC5 found in the proposed south unit addition requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Three small Class IV, G/W, HC5 streams found mid and south unit. Two Class IV, G/W, HC5 streams found in the proposed south unit addition. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate wildlife sign observed during silvicultural exam. NOGO surveys completed: 4/15/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit visible from Luck Lake Boat Launch and Alaska Marine Highway. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Use IT selection (4151) to enhance windfirm buffer conditions. NE portion is mixed hemlock-yellowcedar/spruce having 104 TPA with Dq=18" and 45 TPA dead. 16 TPA occur in the 21"+ DBH class. Decays, cedar decline and defect are concerns. Regenerate to encourage yellowcedar and spruce components. Remainder including new configuration add-on is mostly Hemlock- mixed cedar and spruce. 144 TPA with Dq=19" and 13 TPA dead. 389 TPA occur in the 21"+ DBH class. Crown closure estimated at 65-70%. Partial harvest is feasible using combination of methods with primary reliance on clear cut with reserves in groups and scattered to enhance regeneration objectives of encouraging spruce and cedar regeneration.

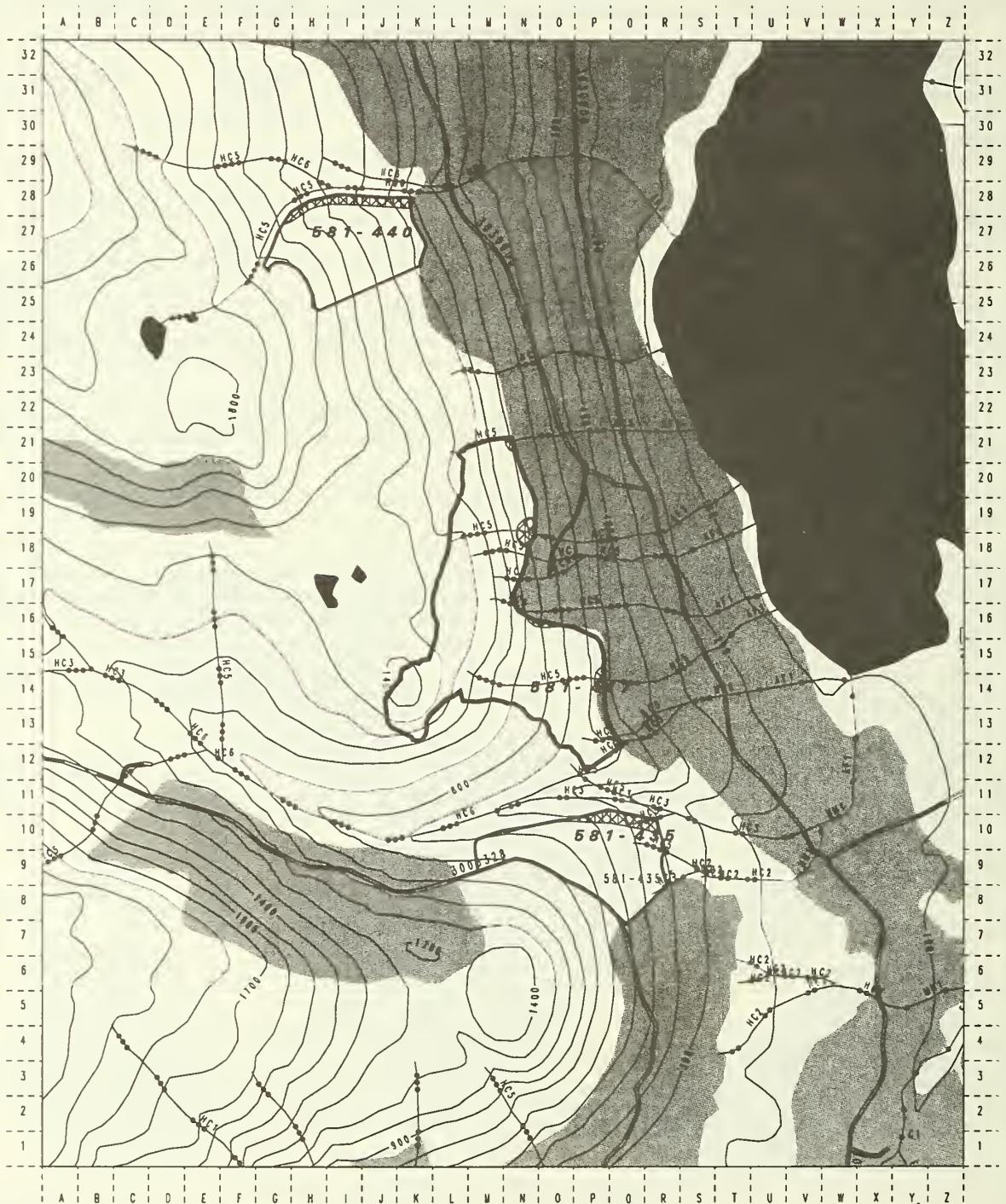
As mapped, this unit lies mostly within two stands.

Stand 49, 9 acres, has 7.207 MBF hemlock, 5.04 MBF spruce and 4.841 MBF yellowcedar for a total of 16.882 MBF per acre.

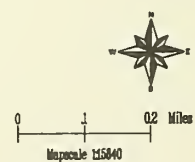
Stand 50, 17 acres, has 7.278 MBF redcedar, 22.728 MBF hemlock, 3.451 MBF yellowcedar and 0.443 MBF spruce for a total of 33.9 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-417 Acres = 66.71**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-417 Planned Acres: 75.9 Estimated Volume: 910.8 MBF In Alternatives: 3,4,6
 Silvicultural System : 4116, 4114/52, 4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-212 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: E
Volume class breakdown:	Class 4:	Class 5:	76	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Luck Lake Boat Launch/Alaska Marine Highway				VQO's:	Modification
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	1	Class III Streams:	1	Class IV Streams: 6
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1-	2- 3- 76 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and Cedar-hemlock-blueberry stands on Tolstoi and St. Nicholas soils. Minor areas of McGilvery soils present. Cliffs less than 30 feet high and slopes over 72 percent occupy about 10 acres scattered through the upper portion of the unit. Landslide potential is moderate to high in most of the unit. Partial suspension will meet soil protection needs (BMP 13.9 and 13.5). A 30 to 50 foot deep V-notch flows along the south side of the unit and has a definable riparian area below the slope-break. The riparian area is entirely within the no-cut buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection needs (BMP 12.6a and 13.16).

Timber Input: Recommend helicopter logging as road construction is difficult, and terrain is not compatible with contemporary cable logging.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class II TTRA, B/W, HC3 stream found along the south unit boundary requiring 100 ft. no-cut buffer and reasonable assurance of a windfirm buffer. One Class III, O/W, HC5 that becomes the above stream requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Three Class IV, G/W, HC5 streams found in the south unit end flowing east and three Class IV, G/W, HC5 streams in the north unit end flowing east. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: Moderate wildlife use indicated during silvicultural exam. NOGO surveys completed: 4/7/97, 4/4/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit visible from Alaska Marine Highway and Luck Lake Boat Launch. Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. Partial harvest type H recommended to mitigate impacts. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

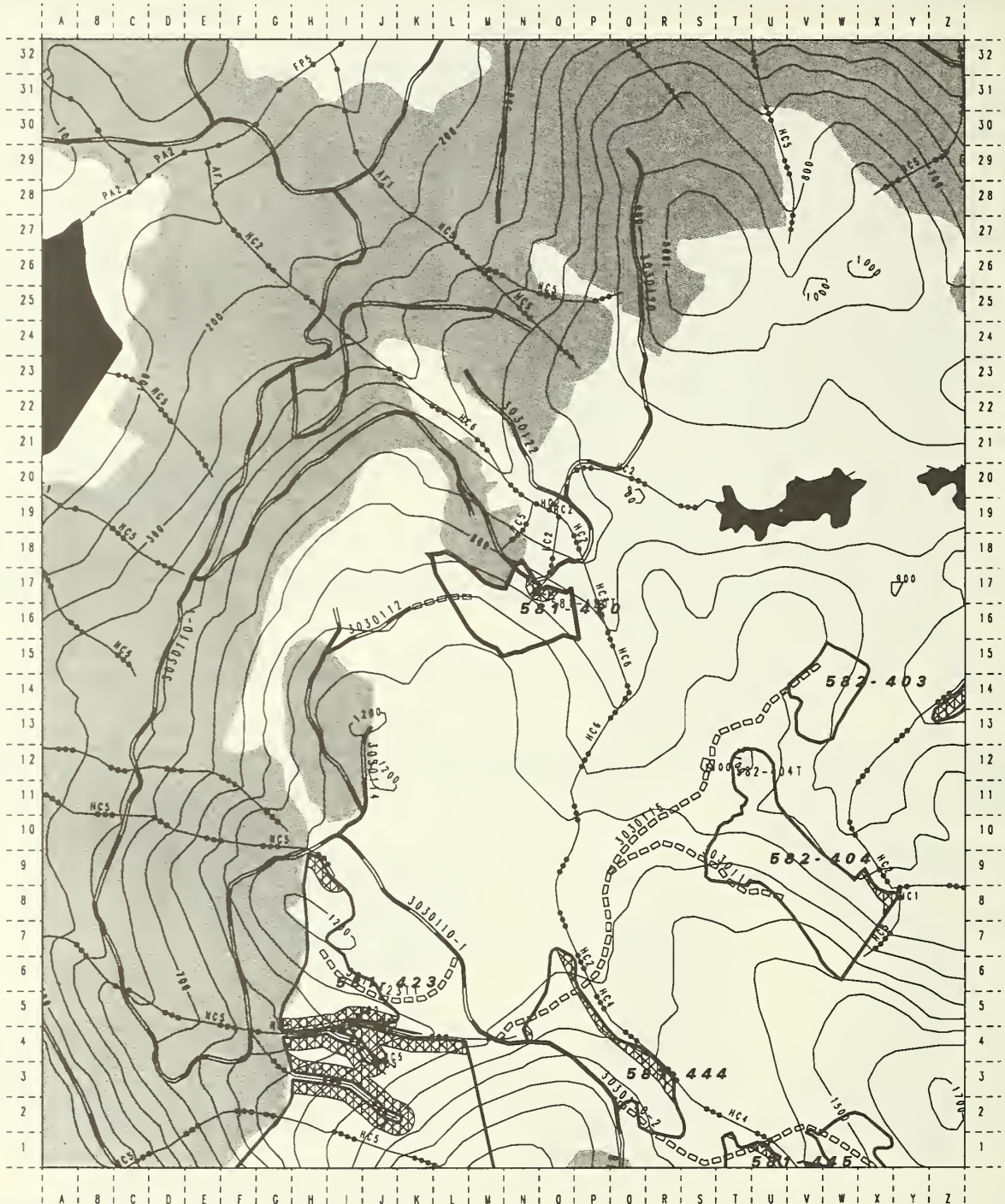
Geological Input: No concerns.

Silviculture Input: From S to N: Stands 78 & 86 are composed of Hemlock-redcedar/spruce/yellowcedar. 138 TPA with Dq=17" and 37 TPA dead. 25 TPA occur in the 21"+ DBH class. Crown closure is about 60% and most yellowcedar occurring are in decline or dead. Decays, wind snap, cedar decline, defects and minor fluting noted. Stand 75 is mostly Hemlock-redcedar. 108 TPA with Dq=19" and 8 TPA dead. 25 TPA occur in the 21"+ DBH class. Decays, defect and windthrow are the concerns. Partial harvest is feasible using a combination of methods to treat wind prone areas. Use clear cut with reserves (4116) in N portion of unit and group reserves in areas where windthrow is less likely. Most other methods are feasible for the remainder of the proposed unit. Regeneration objectives include maintenance/increase of shade intolerant species components.

As mapped, this unit lies within portions of three stands. Stand 86 is very similar to stand 78 and will be considered part of stand 78. Stand 78, 61 acres, has 7.731 MBF hemlock, 7.184 MBF redcedar, 1.306 MBF yellowcedar and 7.531 MBF spruce for a total of 23.752 MBF per acre. Stand 75, 14 acres, has 3.585 MBF yellowcedar, 10.552 MBF redcedar, 7.301 MBF hemlock and 6.176 MBF spruce for a total of 27.615 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-420** Acres= **16.48**

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-420 Planned Acres: 16.5 Estimated Volume: 201 MBF In Alternatives: 3,4,5,6
 Silvicultural System : 4116/4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-208 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: NNE
Volume class breakdown:	Class 4:		Class 5: 17	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Luck Lake Boat Launch/Alaska Marine Highway				VQO's:	Modification
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1-	2- 3-17 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and cedar-hemlock-blueberry stands on slopes up to 70 percent. Areas of forested wetlands on the fringes of the unit and in the eastern end of the unit. Partial suspension will meet wetland and soil resource protection needs (BMP 13.9 and 12.5). One large V-notch with an identifiable riparian area below the slope-break. The entire riparian area will be within the buffer (BMP 12.6 and 12.6a). See Fish/Watershed section for streamcourse protection (BMP 12.6a and 13.16).

Timber Input: Field review verified presence of a large class III V-notch on the eastern boundary resulting in a logical setting break. The original unit boundary was on the other side of the stream creating a partial setting. The unit can be roaded at mid slope from the existing road to the west. Good landing locations were noted along the bench in the upper 1/3rd of the unit.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One large Class III, O/W, HC3 V-notch found along the east unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class IV, G/W, HC5 found along the north unit boundary and one Class IV, G/W, HC2 ~mid-unit flowing north. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Heavy wildlife use noted in silvicultural exam. NOGO surveys completed: 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability area for cultural resources.

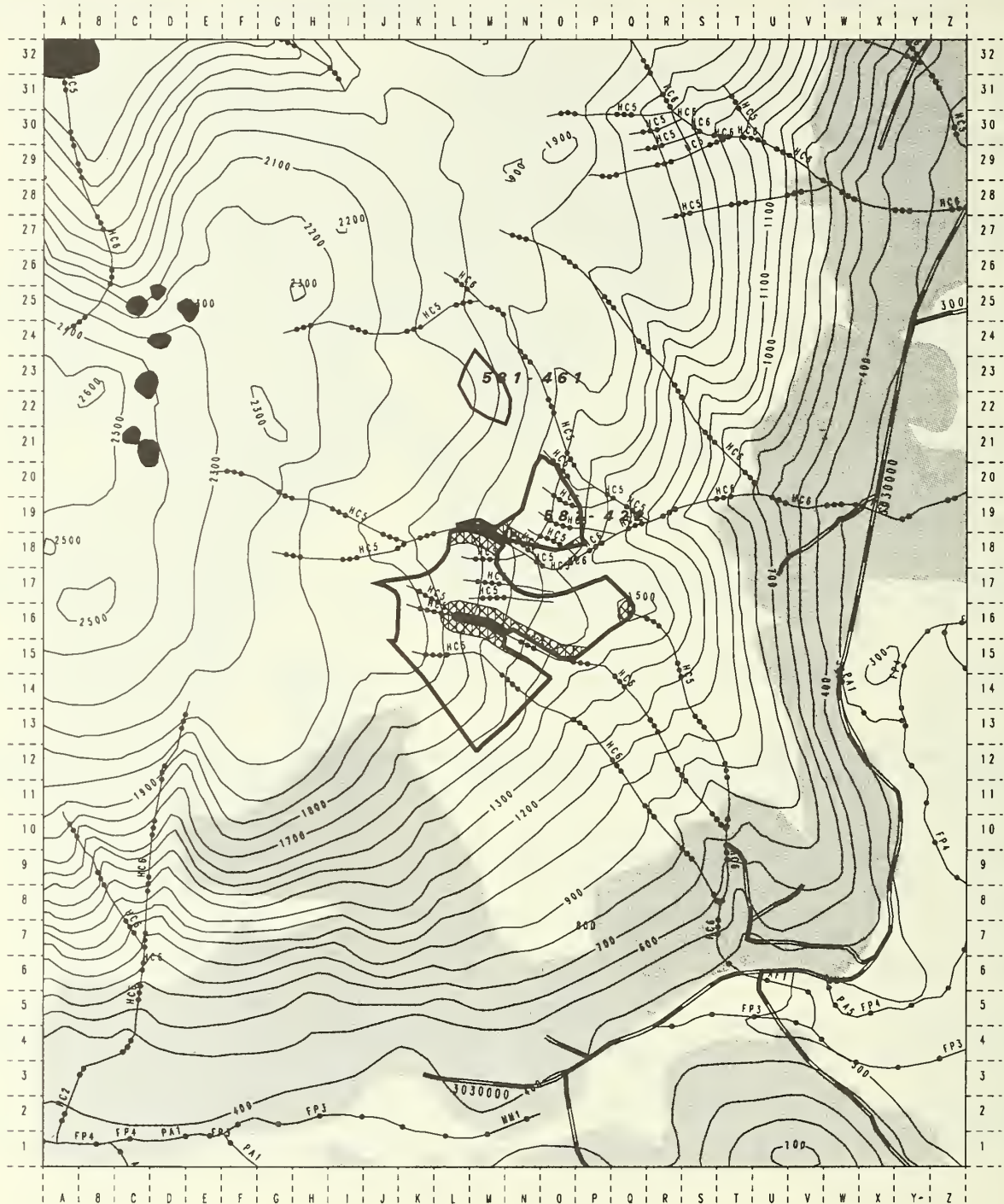
Geological Input: No concerns.

Silviculture Input: Use IT selection to enhance windfirm buffer along E boundary (4151). Timber is Hemlock to N & W and Hemlock-yellowcedar to SE with minor spruce. 86 TPA with Dq=21" and 6 snags/acre occur. 28 TPA occur in the 21"+ DBH class. Stem decays and physical defects are common. Recommend 4116 with group and IT retention to meet S&Gs. Regeneration objectives include maintaining species components found in current overstory.

As mapped, the greatest majority of this unit lies within stand 23 and has 4.9 MBF yellowcedar, 16.643 MBF hemlock and 2.568 MBF spruce for a total of 24.111 MBF per acre.

Luck Lake Project Area Draft Unit Card: 581-422 Acres= 59.23

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-422 Planned Acres: 60.6 Estimated Volume: 1151.4 MBF In Alternatives: 3,4,6
 Silvicultural System : 4143, 4151/2 or 4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-208 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar	Hemlock X	Spruce X	Mixed Hem/Spr X	Nonforested	Aspect: SE
Volume class breakdown:	Class 4:	Class 5:	Class 6: 61	Class 7:		Low Productive
Scenery: Managed Viewshed:	Not Seen		VQO's:	Maximum Modification		
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams: 3		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4- 61		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Unit 422 was modified after reconnaissance to meet resource concerns (BMP 13.2) Unit includes hemlock-blueberry and cedar-hemlock-blueberry-skunk cabbage stands. About 2 acres of the unit lie on slopes over 72 percent near the west unit boundary. Partial suspension is required to protect the soils resource (BMP 13.9 and 13.5). A small non-forested bog lies adjacent to the large V-notch and was included in the notch buffer (BMP's 12.5, 12.6a, and 13.16). The riparian area on three water quality streams occurs below the slope-break and is included in the windfirm buffers (BMP 12.6, 12.6a, and 13.16) See Fish/Watershed section for streamcourse protection measures (BMP 12.6a and 13.16).

Timber Input: Recommend helicopter logging.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, Orange/White, HC6 V-notch found in the north end of the unit requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class III, Orange/White, HC5 V-notch found in the mid-south end of the unit requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Three Class IV, Green/White, HC5 channels found, one along the north unit boundary and two in the mid-south unit end. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate to heavy wildlife sign and snag habitat noted during silvicultural exam. Unit did not meet NOGO survey protocol requirements. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concerns as planned. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

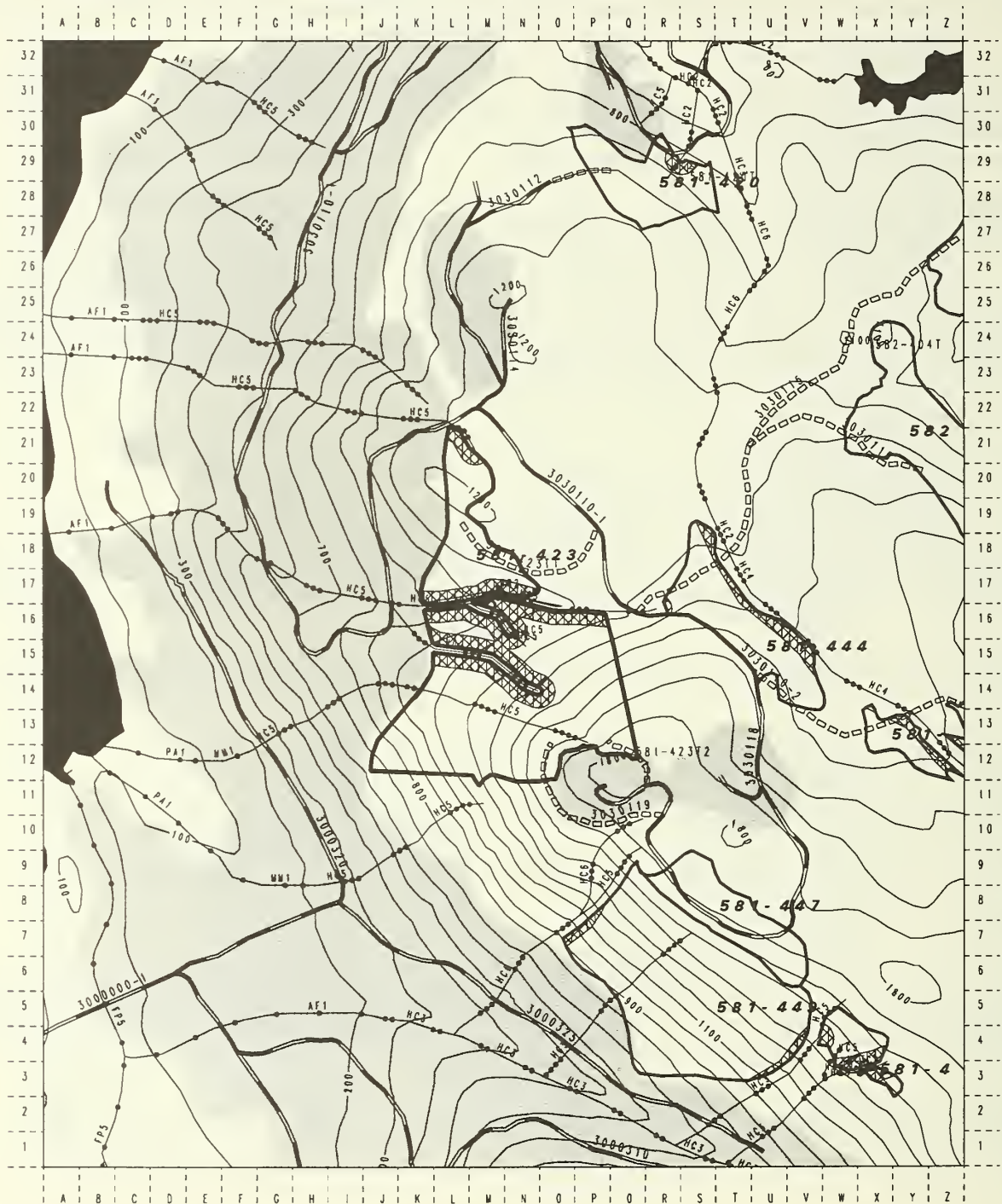
Geological Input: No concerns.

Silviculture Input: Helicopter yarding will allow most silvicultural systems. Open canopy with heavy understory of marsh marigold and devils club may delay regeneration. Decays, defects, fluting, mistletoe and windthrow are concerns. 50-60% canopy closure observed. Between 78 and 89 TPA with Dq=21 to 24" in W. hemlock and mixed hemlock-spruce. 4 to 10 TPA standing dead. 34 to 53 TPA in the 21"+ DBH class occur. Partial harvest is feasible with cautions for windthrow, fluting and mistletoe. Overstory removal may be the best option to preserve existing advance regeneration. Clear cut with reserves or selection methods may also apply.

As mapped, this unit lies mostly within stands 42 and 43 in 58103.
 Stand 42, 28 acres, has 25.636 MBF hemlock and 9.648 MBF spruce for a total of 35.285 MBF per acre.
 Stand 43, 42 acres, has 32.071 MBF hemlock and 8.742 MBF spruce for a total of 40.813 MBF per acre.

Luck Lake Project Area Draft Unit Card: 581-423 Acres= 84.42

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-423 Planned Acres: 89.2 Estimated Volume: 2440.5 MBF In Alternatives: 2,3,4,5,6
 Silvicultural System : 4116, 4151/2 Number of Settings: Quad: Craig D-3 NE Photo: 1090-105 Logging systems: SL
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: W to NW
Volume class breakdown:	Class 4:	Class 5:	Class 6: 89	Class 7:		Low Productive
Scenery:	Managed Viewshed: Luck Lake Boat Launch			VQO's:	Modification	
Recreation:	Primary ROS Code Roaded Modified					
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 3	Class IV Streams: 4		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 77	3- 12 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-spruce-blueberry and cedar-hemlock-blueberry-skunk cabbage stands. About 10 acres of forested wetlands just south of the largest water quality stream mid unit. Small area of non-forested bog in the forested wetland. Slopes less than 70 percent throughout the unit. Small area of moderately well developed karst just north of the largest water quality stream mid-unit. Landslide potential is high in the southern and eastern ends of the unit (BMP 13.5). Partial suspension with retention trees around the stream, in the wetland, and around the more dominant karst features will meet soil resource objectives (BMP 13.9 and 12.5). Opportunities for shovel yarding exist on slopes less than 20 percent in the northern end of the unit and on benches in the middle portion of the unit (BMP 13.9). Riparian areas occur below the slope-break on the larger middle stream and the north boundary stream (BMP 12.6). See Fish/Watershed section for streamcourse protection needs (BMP 12.6a and 13.16). Windthrow potential of residual timber is a concern along the upper elevations in this unit.

Timber Input: 70 acres to be logged with a slackline logging system the remaining 20 acres on the southwest portion will likely have to be helicopter yarded.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input : Three Class III O/W streams found. Northern most stream is a karst channel and for 200 ft. water appears to run subsurface; the flagged reach serves as an overflow channel when the subsurface system is full. Four Class IV, G/W streams found. Apply BMP's 12.6 & 12.6a, 13.9, 13.10, 13.11, 13.12, 13.16, 14.3, 14.5, and 14.7.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. NOGO surveys completed: 4/10/97, 4/28/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: Karst present in N end. Recommend deferring lands N of Karst stream channel near stand boundary 39 and 40 with stand 49 per silvicultural exam. Temporary road accessing harvest unit should avoid all high vulnerability karst resources to the northeast of unit.

Silviculture Input: High windthrow concern in Karst area (stands 30, 39 and 40) - recommend deferral. Windthrow heavy along S edge of stand 49 and E edge of stand 54. From S to N, stand descriptions follow: Stand 55 has 159 TPA with Dq=20" and only 3 TPA dead. 53 TPA occur in the 21"+ DBH class. Composition is Hemlock-yellowcedar/spruce and crown closure is approx. 70%. Stand 54 has 89 TPA with Dq=22" and 2 TPA dead. Composition is Hemlock-redcedar/spruce. There are 23 TPA in the 21"+ DBH class and crown closure is approx. 70%. Stand 49 is composed of mostly Hemlock and spruce. 120 TPA with Dq=20" and 5 TPA dead with crown closure of approx. 70%. 33 TPA occur in the 21"+ DBH class. Stem decay, physical defects, windthrow and mistletoe are major concerns. Partial harvest is feasible with cautions to reduce windthrow damage to residual stand. Windthrow may not be completely avoided if residual stems are left. Group all retention and use IT selection (4151) to enhance if necessary. Clear cut with reserves (scattered and/or in groups as ground conditions and windthrow risk permits) for the remainder of the treatment unit.

As originally mapped, this unit is composed of portions of five stands. The northern parts of the planned unit in stands 30 and 39 have been deferred due to karst and watershed concerns. The extreme southern portion within stand 55 had been deleted due to soils and slope. Acres and descriptions below are from the original configuration. VCU and compartment is 58102.

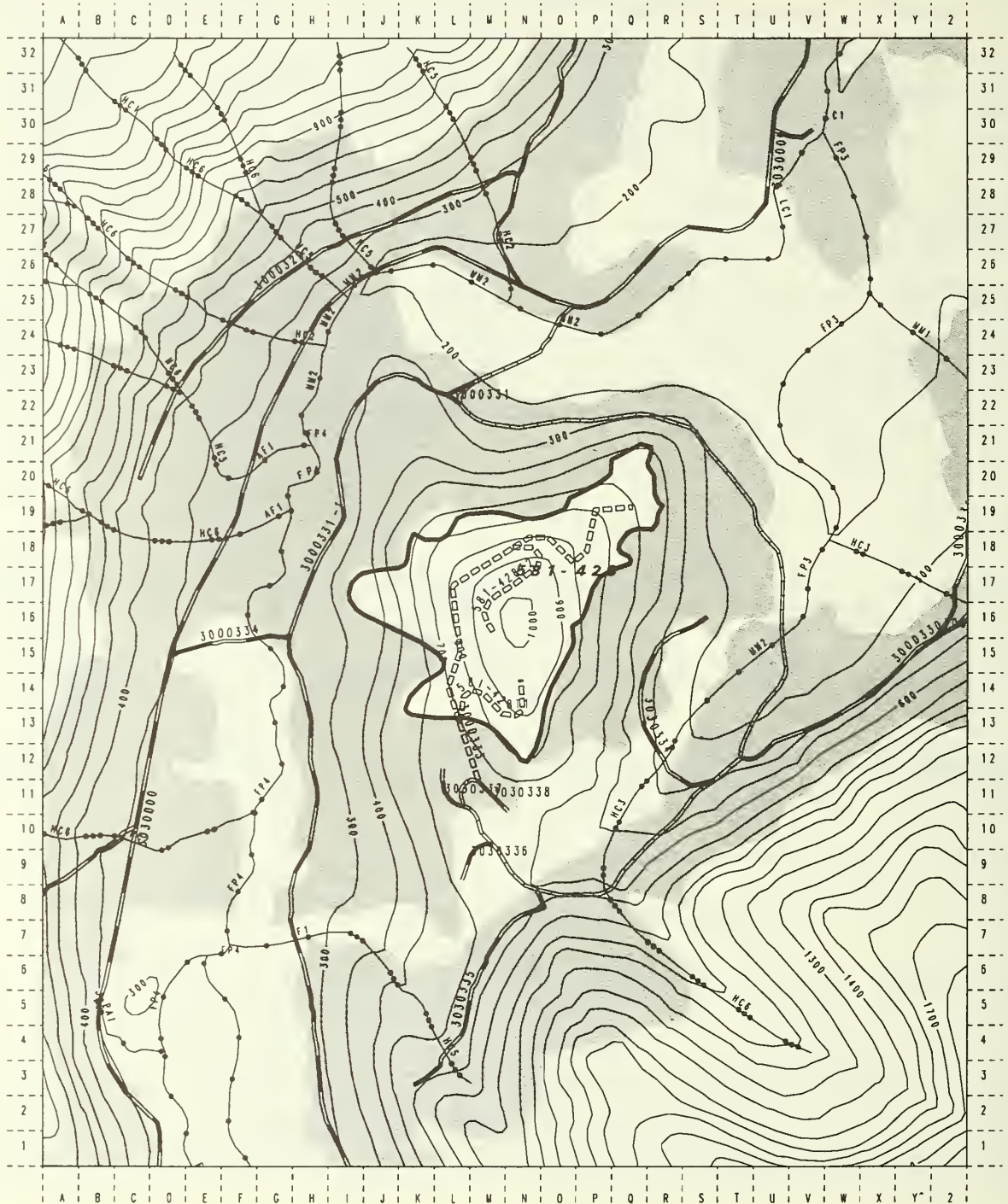
Stand 49, 37 acres, has 32.290 MBF hemlock, 20.879 MBF spruce and 1.567 MBF yellowcedar for a total of 54.736 MBF per acre.

Stand 54, 8 acres, has 14.866 MBF hemlock, 0.387 MBF redcedar, 23.903 MBF spruce and 2.160 MBF yellowcedar for a total of 41.315 MBF per acre.

Stand 55, 24 acres, has 15.878 MBF hemlock, 20.093 MBF spruce and 14.536 MBF yellowcedar for a total of 50.507 MBF per acre.

Luck Lake Project Area Draft Unit Card: 581 - 428 Acres = 84.85

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-428 Planned Acres: 84.9 Estimated Volume: 1596.7 MBF In Alternatives: 2,3,4,5,6
 Silvicultural System : 4114/4152, 4116/4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-108 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SW to N to NE
Volume class breakdown:	Class 4:		Class 5: 47	Class 6: 38	Class 7:	Low Productive
Scenery:	Managed Viewshed: Luck Lake Boat Launch			VQO's: Modification		
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 4		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 38 3- 47 4-		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and cedar-hemlock-blueberry stands on slopes up to 120 percent. About 12 acres of slopes over 72 percent occur in two locations in the unit. About 10 acres of 80 to 85 percent slopes occur in the west end of the unit on smooth slopes. About 2 acres of cliffy 100 percent slopes occur along the southeast side of the unit. Thin McGilvery like soils occur around the cliffs in the southeast side of the unit. Windthrow along the western unit boundary is a concern. A combination of partial suspension and reserve tree placement will meet soil resource objectives (BMP's 13.5 and 13.9). A small non-forested bog and forested wetland (cedar-hemlock-blueberry-skunk cabbage) occurs in the northeastern part of the unit. Reserve trees and partial suspension around the bog will meet resource concerns (BMP 12.5 & 13.9). Unit 428 was reconfigured following reconnaissance to avoid cliffs on north side and reduce windthrow potential (BMP 13.2).

Timber Input: Recommend running skyline logging to continuous landing with corridor cuts.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Four Class IV, G/W streams on the N and the NW boundaries located by Dennis Landwehr. No other water quality or fisheries concerns. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: Moderate to high wildlife use noted during silvicultural exam. NOGO surveys completed: 4/4/97, 6/30/98. Implement marten and goshawk S&G's to retain => 30% canopy closure

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

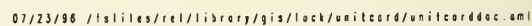
Silviculture Input: High windthrow is occurring along W edge of N portion of unit. Mix of Hemlock-redcedar and yellowcedar in N part with Hemlock-yellowcedar/redcedar/spruce in central and southern portions. Between 151 and 100 TPA with Dq=19-20" and 18-34 TPA dead. 26 to 21 TPA in the 21"+ DBH class. Decays, defects, light mistletoe, cedar decline, and windthrow are concerns. Canopy closure between 65 and 75%. Partial harvest is feasible with cautions for windthrow potential and mistletoe. Use grouping either by patch clear cut or reserve groups in windprone areas (4114/4152 or 4116). Use clear cut with reserve groups in remainder of unit with IT selection in reserve groups to enhance windfirm conditions (4116, 4151). Target sheltered landforms with little wind damage indication as reserve sites where possible.

This unit as mapped, lies within portions of two stands in 58104.

Stand 31 (north part of unit), 22 acres, has 26.726 MBF hemlock, 9.372 MBF redcedar, 3.675 MBF spruce and 2.702 MBF yellowcedar for a total of 42.475 MBF per acre.

Stand 22, 19 acres, has 17.529 MBF hemlock, 5.529 MBF spruce, 3.312 MBF redcedar and 3.324 MBF yellowcedar for a total of 1596.7 MBF per acre.

Mopscote 1:15840 (4 inch to Mile)



Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-434 Planned Acres: 19.8 Estimated Volume: 415.8 MBF In Alternatives: 2,3,4,6
 Silvicultural System : 4114, 4151/2, 4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-213 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SE
Volume class breakdown:	Class 4:	Class 5:	Class 6: 20	Class 7:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Luck Lake Boat Launch			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 20 4-	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-oak fern stands on 40 to 65 percent slopes. Soils are moderately well drained and belong to the Karta soil series. Partial suspension will meet soil resource objectives (BMP 13.9). An 80 foot deep V-notch has a riparian area that extends to the slope-break. The riparian area is entirely within the no-cut buffer (BMP 12.6). See Fish/Watershed section for buffers and streamcourse protection (BMP's 12.6a and 13.16).

Timber Input: Defer S. portion of original configuration where streams cause felling/yarding difficulties. Recommend helicopter logging.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Two Class III, Orange/White, HC6 V-notches found along the south and west unit boundaries requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class IV, Green/White, HC5 found flowing into the south stream near the southeast unit corner. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate to high wildlife use noted during silvicultural exam. Grouse noted outside unit in clear cut to the north. NOGO surveys completed: 4/7/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

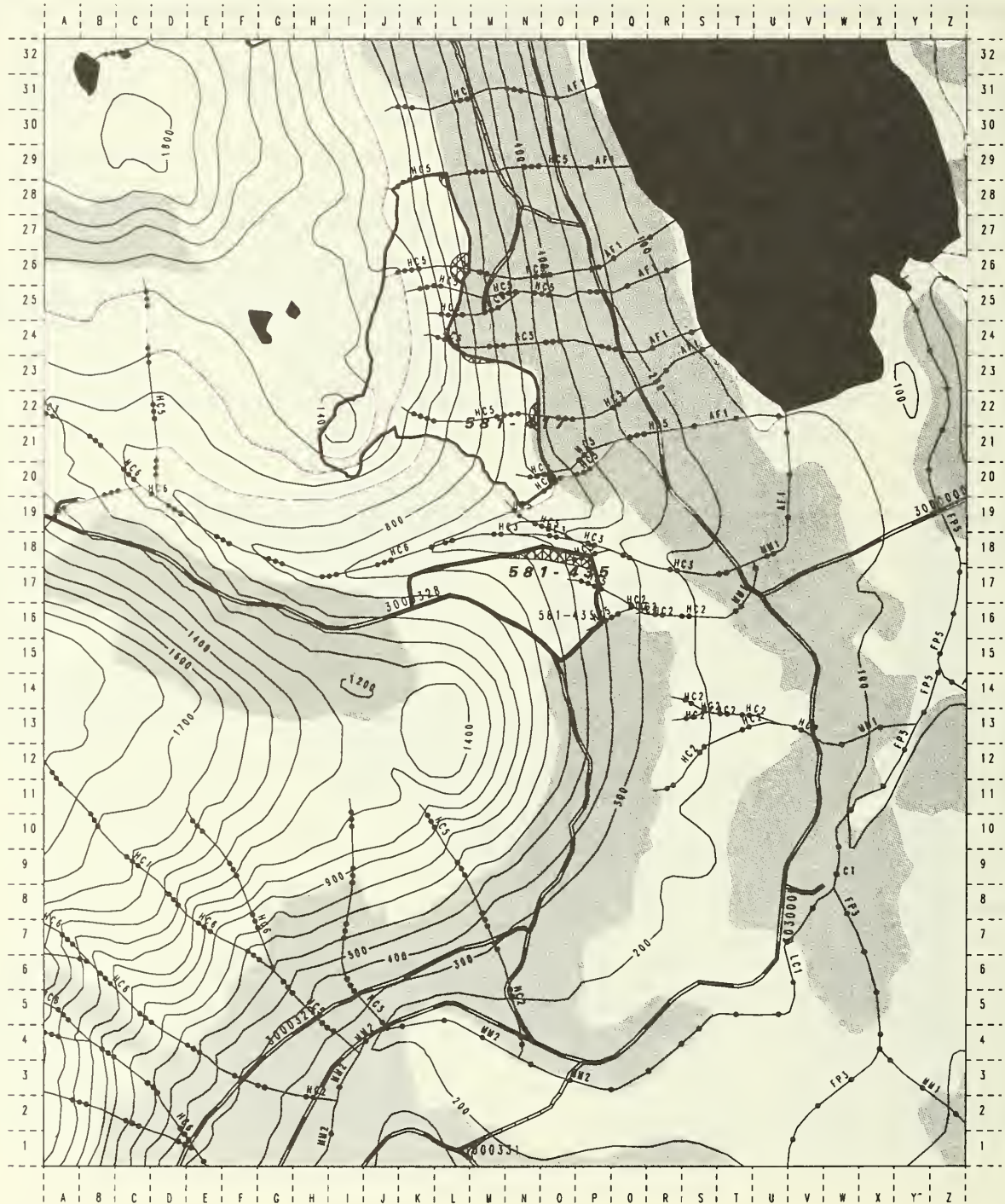
Geological Input: No concerns.

Silviculture Input: Exam shows volume to be at bottom end of VC7; VC6 call is accurate. Current marginal adjacency for new configuration (adjacent to 1990 harvest). Exam and recon show similar conditions in two stands within the proposed configuration. 101 TPA with Dq=23" and 25 TPA dead. 46 TPA occur in the 21"+ DBH class. Hemlock-yellowcedar with some spruce and minor redcedar component. Crown closure about 75%. Decays, windthrow, light cedar decline, physical defect are concerns. Partial harvest is feasible to meet S&G's with caution for windthrow. Use patch clear cut with some selection/group selection and locate reserves where windfirm indications exist. Alternate Rx using 4116, grouping reserves and using selection/group selection to enhance windfirmness.

This unit lies mostly within stand 58101-65 and has 20.511 MBF yellowcedar, 14.120 MBF hemlock, 16.913 MBF spruce and 0.274 MBF redcedar for a total of 51.819 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-435** Acres= **23.81**

Mapscale 1:15840 (4 inch to Mile)



Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-435 Planned Acres: 24.1 Estimated Volume: 446 MBF In Alternatives: 3,4,5,6
 Silvicultural System : 4116/4152, 4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-105 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: E
Volume class breakdown:	Class 4:	Class 5: 12	Class 6: 12	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Not seen	VQO's:	Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams: 1	Class III Streams: 1	Class IV Streams: 3		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1-	2- 3- 24 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry-devil's club on slopes less than 70 percent. Cedar-hemlock-blueberry-skunk cabbage forested wetland in the east end of the unit. Partial suspension will meet resource protection needs (BMP 12.5 & 13.9). A large V-notch occurs along the north side of the unit and has a riparian area that extends to the slope-break. The riparian area is entirely within the buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection needs (BMP's 12.6a and 13.16). Unit 435 was reconfigured following recon to avoid stream buffers and lower volume stands on wetlands (BMP 13.2).

Timber Input: Recommend running skyline logging.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class II TTRA, Blue/White, HC2 with two ~100 ft. tributaries found just inside the south unit boundary requiring 100 ft. no-cut buffers and reasonable assurance of a windfirm buffer. One Class III, Orange/White, HC3 V-notch found along the north unit boundary requiring slope-break buffer and reasonable assurance of a windfirm buffer. Three Class IV, Green/White, HC5 streams found in the west end of the unit flowing east. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3, 14.5 and 14.7.

Wildlife Input: Moderate wildlife use & value per silvicultural exam observations. NOGO surveys completed: 4/7/97, 4/4/97, 4/28/98. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit is screened by topography. No established recreation.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit is outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Exams indicate 54 TPA with Dq=27" plus 9 snags/acre. 40 TPA occur in 21"+ DBH class. Hemlock-redcedar and some spruce occur. De-cays, some hemlock defoliation, light mistletoe and windthrow occur and are of concern. Wind damage potential is strong throughout the stand. Crown closure is approx. 60%. Stream buffer to the N. may not be windfirm and selection harvest within the windfirm portion is recommended. Partial harvest is feasible with caution for windthrow and mistletoe infections. Use clear cut with reserves and/or group selection where possible. Target drier sites for retention where possible and use IT selection within windfirm portion of stream buffer.

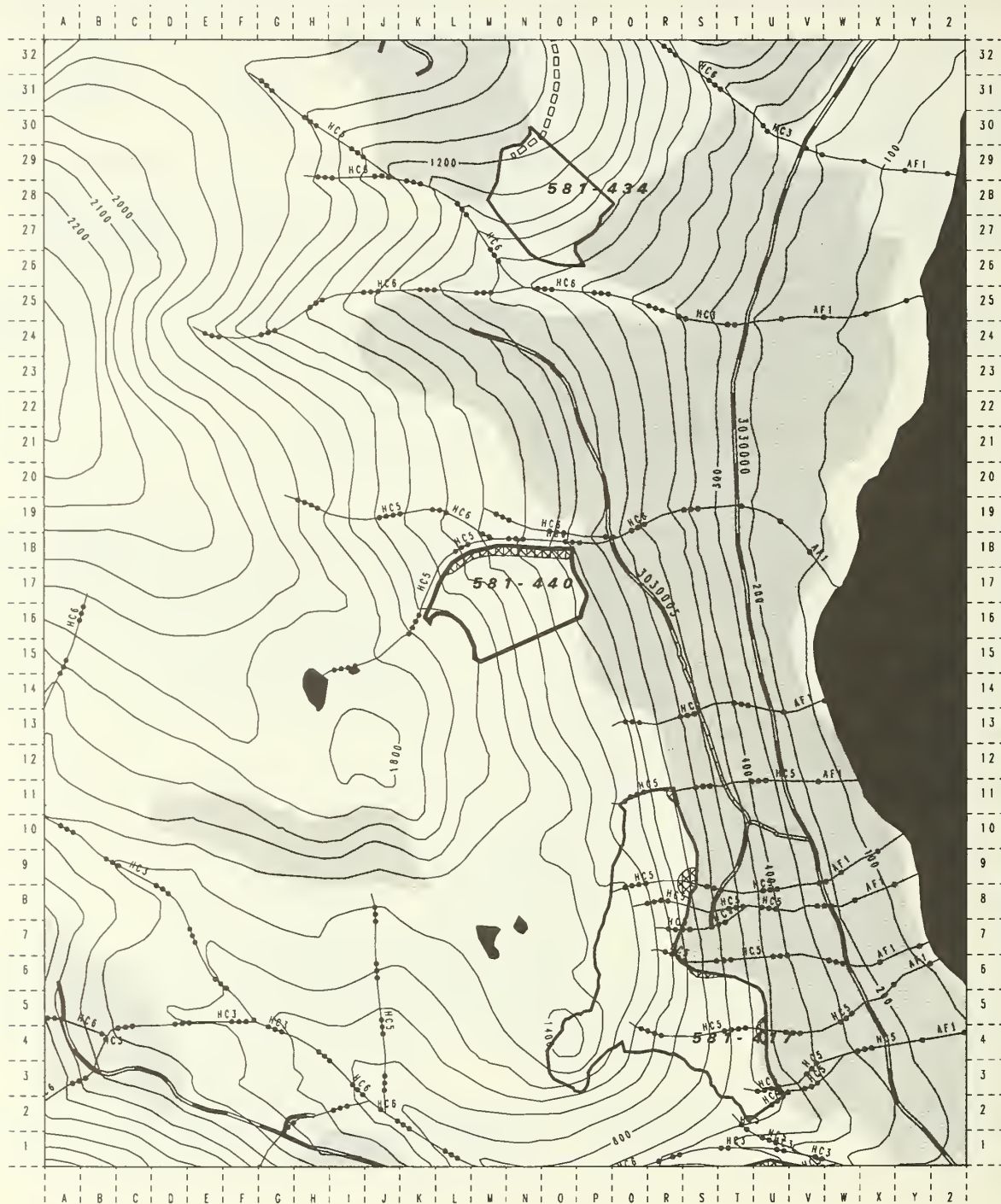
This unit lies within portions of two stands in 58103.

Stand 22, 4 acres, has 4.182 MBF spruce, 21.526 MBF hemlock, and 6.072 MBF redcedar for a total of 31.780 MBF per acre.

Stand 23, 3 acres, has 6.306 MBF hemlock, 16.132 MBF redcedar, 1.419 MBF spruce and 1.192 MBF yellowcedar for a total of 25.050 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-440 Acres= 24.21**

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-440 Planned Acres: 24.2 Estimated Volume: 562 MBF In Alternatives: 2,3,4,6
 Silvicultural System : 4114/52, 4116, 4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-212 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: E
Volume class breakdown:	Class 4:	Class 5:	Class 6: 24	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Luck Lake Boat Launch/Alaska Marine Highway				VQO's:	Modification
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 24	3- 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry stands on somewhat poorly drained soils. Forested wetlands occupy 15 percent of the unit and include deer cabbage and marsh marigold in the understory. Slopes range up to 70 percent. Unit 440 was reconfigured following reconnaissance to avoid slopes over 72 percent and two water quality streams (BMP 13.2). Full suspension is required on a small portion of the steeper slopes. Partial suspension on the rest of the unit (BMP 12.5, 13.9). See Fish/Watershed section for streamcourse protection requirements (BMP 12.6a and 13.16). Add one water quality stream along the south unit boundary for directional felling and split yarding (BMP 13.16).

Timber Input: Felling/yarding difficulties in N portion. Move unit plan S to avoid concerns. Helicopter yard entire unit.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC6 V-notch found along north unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm. One Class IV, G/W, HC5, that becomes Class III, O/W, HC5 as it flows into the northern stream, found requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class IV, G/W, HC5 found in north unit that flows into north boundary stream ~mid-north boundary. One significant class III, O/W, HC6 stream identified outside the proposed north unit boundary. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.6.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. Sharp-shinned hawk observed flying through on 10/30/97 by silviculture crew. NOGO surveys completed: 4/07/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Move original configuration S. to avoid stream/soils conflicts. Timber stands are very similar mostly hemlock with some spruce, moderately high volume. Uphill timber has 75 TPA with Dq=25" and about 5 snags/acre. 40 TPA in the 21"+ DBH class occur. Lower elevation timber has nearly the same merchantable statistics with 30 TPA in the 21"+ DBH class. Physical defect, decays, light mistletoe, broom rusts and scattered windthrow are all of concern. Partial harvest to meet S&G's is feasible with cautions for windthrow risk and mistletoe infection. Overall canopy closure is 65%. Use clear cut with reserves (4116) and IT selection along stream buffers and reserve patches. Some patch clear cut or group selection may be appropriate to remove mistletoe or high risk to wind stems. Target broom rust and wolfy trees in small groups for retention on areas where drier conditions and windfirm indications exist.

This unit lies within portions of two stands in 58101.

Stand 69 (western part of unit), 9 acres, has 37.382 MBF hemlock and 5.951 MBF spruce for a total of 43.333 MBF per acre.

Stand 75, 14 acres, has 46.163 MBF hemlock and 5.524 MBF spruce for a total of 51.686 MBF per acre.

Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-444 Planned Acres: 21 Estimated Volume: 167.2 MBF In Alternatives: 2,3,4,6
 Silvicultural System : 4116, 4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-6 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4: 6	Class 5: 15	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 21 4-	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and cedar-hemlock-blueberry skunk cabbage stands. Forested wetlands in the east and west end of the unit. Most of the unit is upland. Slopes are less than 35 percent throughout the unit. Partial suspension required throughout the unit to protect resources (BMP 12.5 and 13.9). The stream along the northeast boundary has a riparian area that extends to the slope-break. The entire riparian area is within the buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection (BMP 12.6a and 13.16).

Timber Input: Recommend running skyline logging to existing road. There will be a cave buffer forming the southern boundary, field review by Karst specialist during implementation.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC4 found along east unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Fisheries recon found no other streams within this unit. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate wildlife use and value noted during silvicultural exam. NOGO surveys completed 4/10/97, 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: Possible karst resource concerns. Unit underlain by low to moderate vulnerability karst. Partial suspension is required.

Silviculture Input: Some trees removed during previous free-use harvest. Stream along NE edge required small buffer plus windfirm of 1 tree height. Northern portion of planned unit has 219 TPA with Dq=15" and 31 TPA dead. 16 TPA occur in 21"= DBH class. Mostly hemlock-yellowcedar, there is a real mix of diameter classes and heights probably due to wind disturbance and wetland micro sites. The majority of the planned unit has about 83 TPA with Dq=23" and 11 TPA dead. 36 TPA occur in the 21"+ DBH class. Hemlock-yellowcedar and some spruce dominate. Stem decays, defects and historic wind disturbance are concerns. Partial harvest is feasible to meet S&G's using clear cut with reserves (4116 and individual tree selection methods within the extended stream buffer to enhance windfirmness. Alternative of patch clear cut/group selection (4114, 4152) combined with clear cut with reserves (4116) is also feasible. Locate retention on dryer sites with windfirm indication.

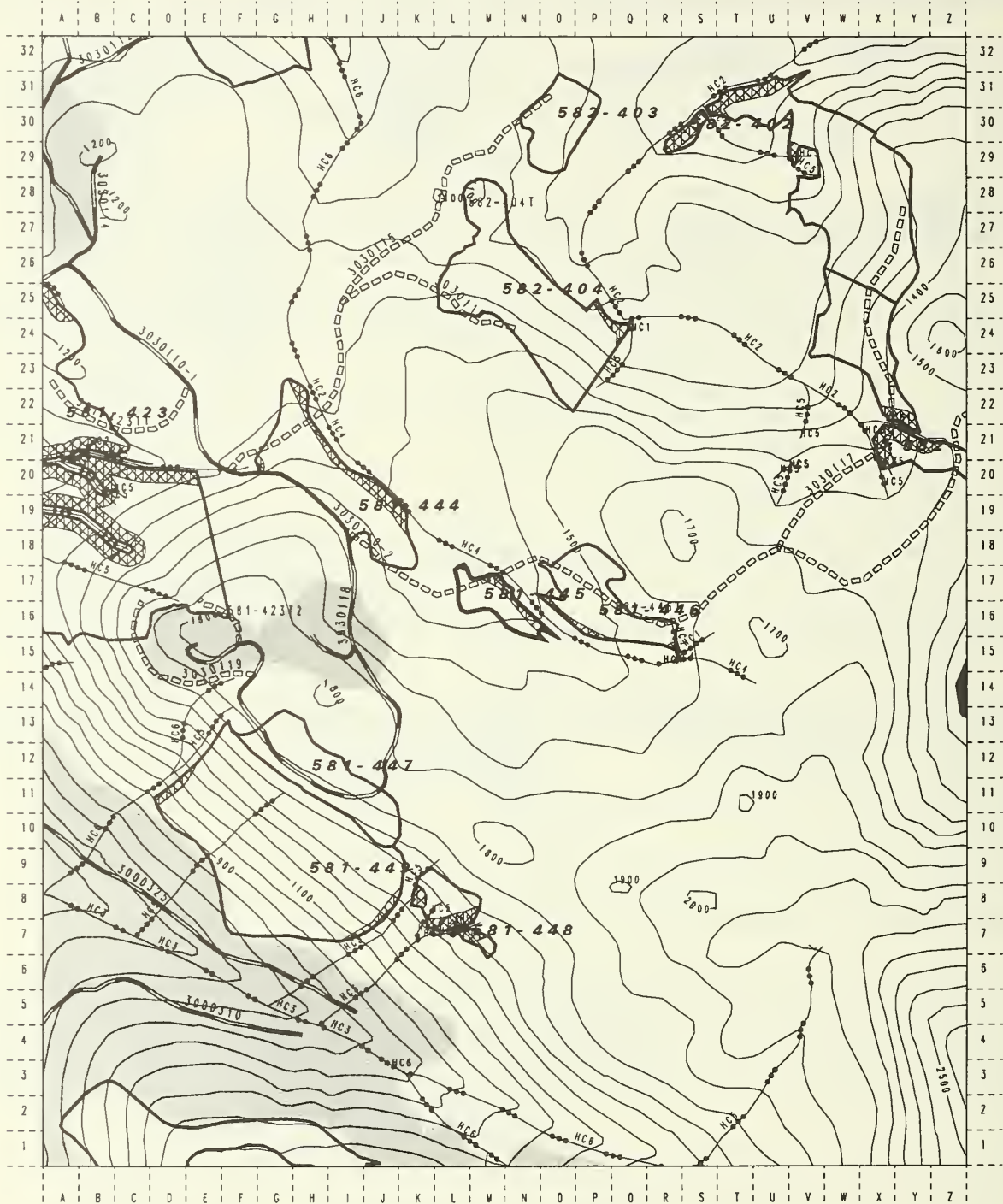
This unit lies within portions of two stands in 58102.

Stand 41, 5 acres, has 5.234 MBF hemlock and 8.72 MBF yellowcedar for a total of 20.853 MBF per acre. Spruce is present but shows only 101 net cubic feet volume.

Stand 49, 11 acres, has 20.673 MBF hemlock, 7.837 MBF spruce and 6.898 MBF yellowcedar per acre for a total of 35.408 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-445 Acres= 5.62**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|-----------------------|-------------------|-----------------------|
| —●— Class 1 stream | □ Second-growth | — Unit Boundary |
| —●●— Class 2 stream | ▤ Windfirm Buffer | — Other unit boundary |
| —●●●— Class 3 stream | ■ Freshwater | — Existing Roads |
| —●●●●— Class 4 stream | ▨ Saltwater | — Reconstruct Roads |
| | | □□□□ Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

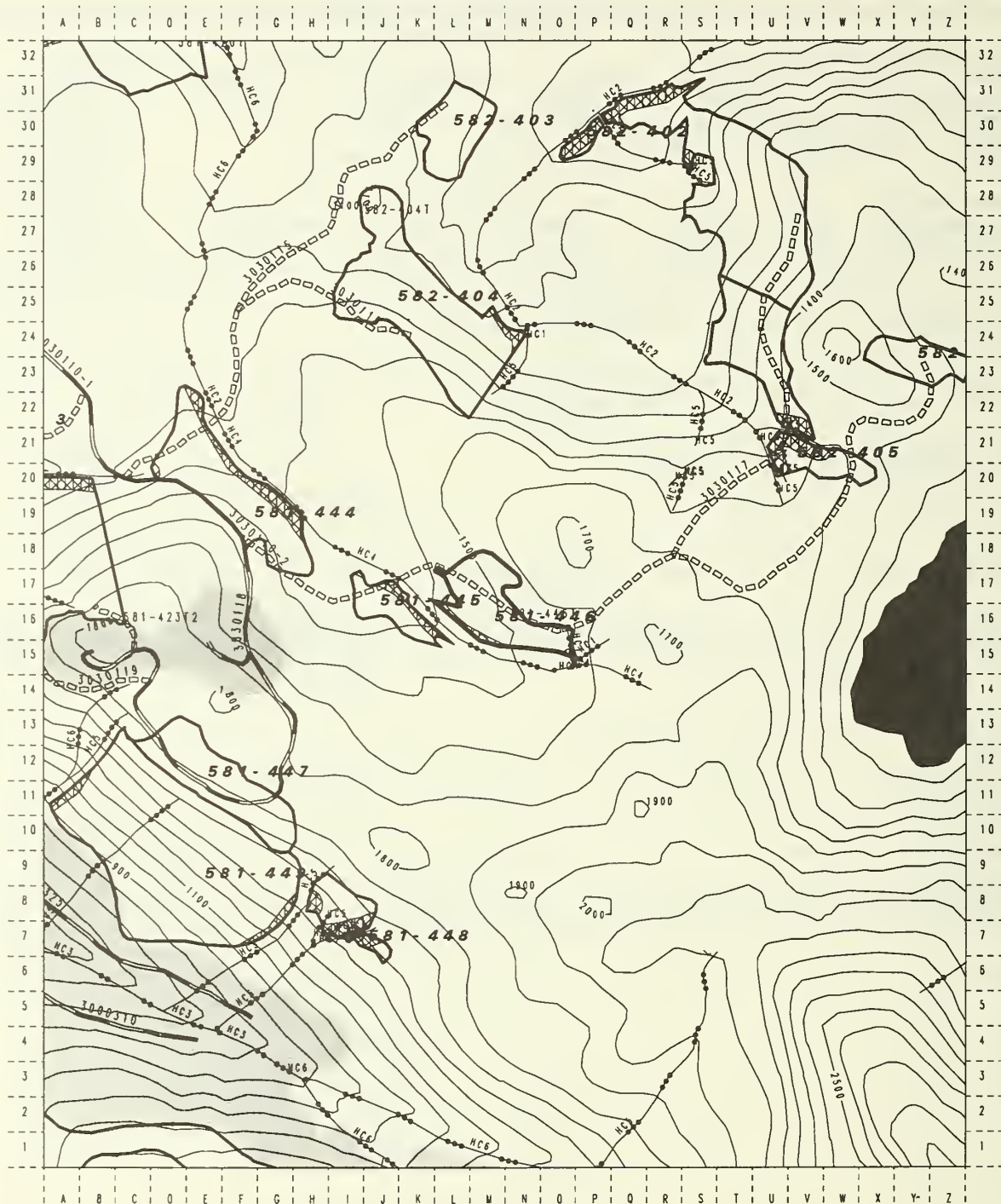
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Luck Lake DEIS - Unit Data Card - Planned Configuration					
Unit: 581-445	Planned Acres: 5.6	Estimated Volume: 50 MBF	In Alternatives: 2,4,6		
Silvicultural System : 4116, 4151	Number of Settings: 2	Quad: Craig D-3 NE	Photo: 1090-6	Logging systems: RS	
WAA Number: 1420					

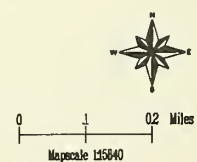
Physical Description									
(Numbers are Acres unless otherwise noted)									
Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect:			
Volume class breakdown:	Class 4: 5.6		Class 5:	Class 6:	Class 7:	Low Productive			
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification				
Recreation:	Primary ROS Code	Roaded Modified							
Riparian MA:	Class I Streams:		Class II Streams:		Class III Streams:		Class IV Streams:		
Soils:									
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%			
Wetland Information:	Wetland	Mix Wetland	Riparian Soil		Site Productivity	Classes 1-	2-	3-	4-
High Value Habitat:	Sitka Black-Tail Deer-		Marten-	River Otter-	Bald Eagle-	Black Bear-			
Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.									
Soils Input: Hemlock-Blueberry and cedar-hemlock-blueberry skunk cabbage stands. Minor amount of forested wetlands present throughout the unit. Slopes in the are generally less than 35%. Partial suspension recommended to protect resources.									
Timber Input: Recommend running skyline logging with a small slackpulling carriage capable of lateral yarding to provide for 30% canopy closure recommend clumping leave trees as much as possible to better facilitate yarding and falling.									
Engineering Input: See attached road card in Appendix C.									
Fish/Watershed Input: No concerns as planned.									
Wildlife Input: NOGO surveys completed 4/10/97, 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.									
Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.									
Lands Input: No state/private or encumbered lands adjacent to unit.									
Cultural Resource Input: Unit outside of high probability areas for cultural resources.									
Geological Input: Karst areas were identified adjacent to the unit. Mitigation (per Forest Plan) will be implemented on any Karstlands adjacent to unit boundary.									
Silviculture Input: Unit has approximately 200 TPA . There is a large array of diameter classes present within the stand due to wind disturbance and differing site conditions. Minimal amount of spruce present primarily yellowcedar/hemlock. Locate retention areas on drier sites to promote windfirmness.									

Luck Lake Project Area Draft Unit Card: **581-446** Acres= **13.15**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-446 Planned Acres: 13.2 Estimated Volume: 72.6 MBF In Alternatives: 2,4,6
 Silvicultural System : 4114/4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-6 Logging systems: RS/SH
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect:
Volume class breakdown:	Class 4: 5	Class 5: 6	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Not Seen	VQO's:	Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2-	3- 4- 13
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry and cedar-hemlock-blueberry-skunk cabbage stands on slopes less than 50 percent gradient. About 60 percent of the unit is forested wetlands. Partial suspension will meet resource protection needs (BMP 12.5 and 13.9). A small riparian area extends to the slope-break on the V-notch. The riparian area is entirely within the buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection needs (BMP 12.6a and 13.16).

Timber Input: Recommend logging the unit with a small running skyline and shovel system. The majority of the unit is relatively gentle. Retain leave trees in patches where practical.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC4 V-notch found along the south unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Two Class IV, G/W, HC1/HC2 streams found in the southeast corner of the unit flowing into the V-notch. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate use but very high browse activity noted during silvicultural exam. NOGO surveys completed: 4/10/97, 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit not visible from any priority use area. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability area for cultural resources.

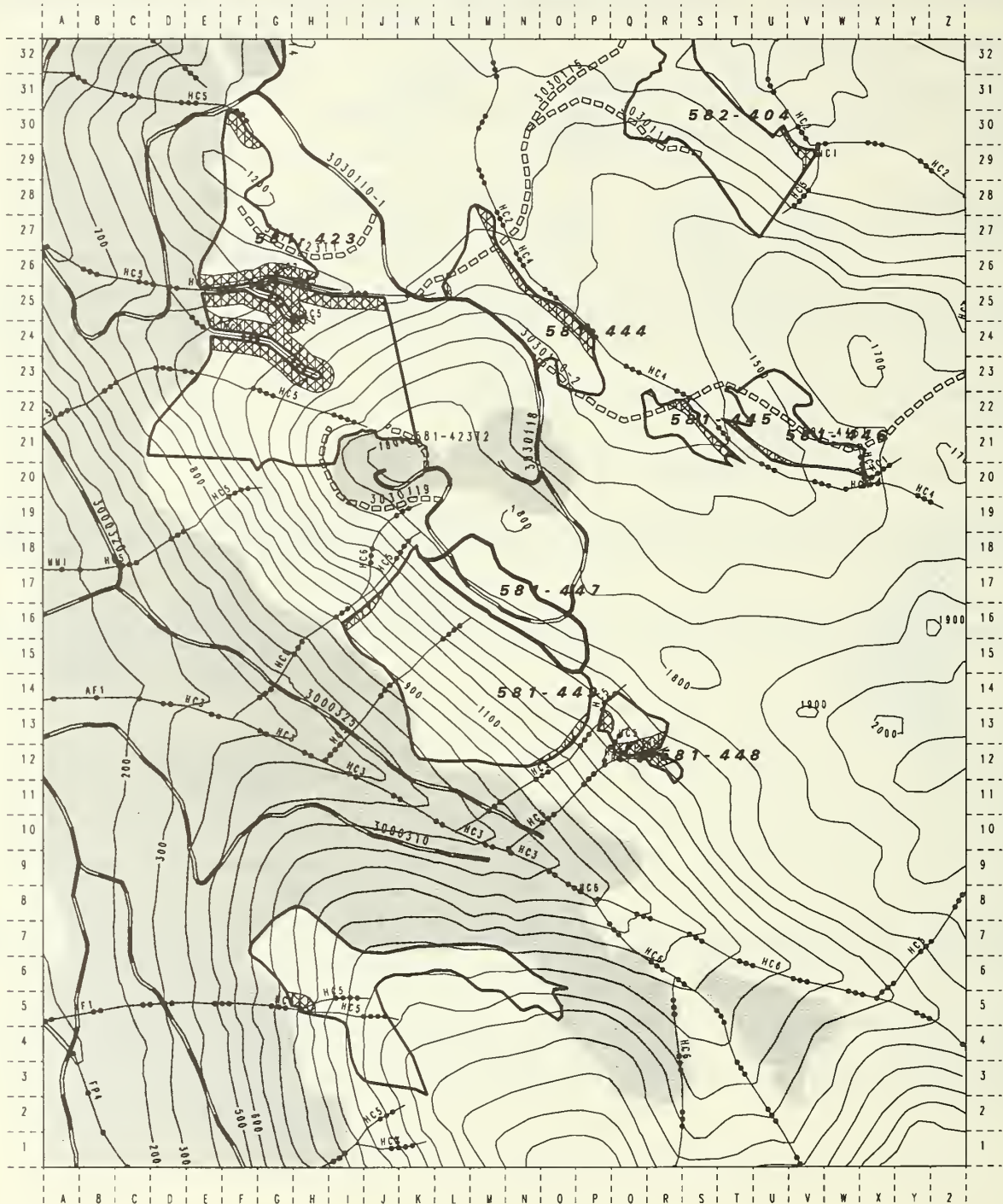
Geological Input: No concerns.

Silviculture Input: Walk through exam indicates moderate to low volume with some scattered large trees. Patchy conditions characteristic of older wind disturbance exist. Average crown closure is 40%. North end of proposed unit is much more productive but still VC 5 and crown closure of about 60%. Partial harvest may be feasible with poor economics. Recommend patch clear cut (4114) or clear cut with reserves (4116) or combination.

This unit lies within stand 58102-44 (3 acres) with estimated BA of 360 sq. ft./acre with 80 sq. ft. of spruce, 80 sq. ft. of hemlock, and 200 sq. ft. of yellowcedar. 120 sq. ft. per acre is dead (yellowcedar). The NW portion of the unit lies within stand 43 (11 acres) with estimated BA of 360 sq. ft., 80 sq. ft. of spruce, 40 sq. ft. of yellowcedar and 120 sq. ft. of hemlock. No direct volume estimates were made.

Luck Lake Project Area Draft Unit Card: **581-447 Acres= 15.56**

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-447 Planned Acres: 15.6 Estimated Volume: 206 MBF In Alternatives: 2,3,4,6
 Silvicultural System : 4116, 4151 / 4114, 152 Number of Settings: Quad: Craig D-3 NE Photo: 1090-7 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SW
Volume class breakdown:	Class 4: 7		Class 5: 9	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Not Seen		VQO's: Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 5 4- 11	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and cedar-hemlock-blueberry stands on shallow well drained McGilvery and Tolstoi soils. Unit 447 was reconfigured to avoid slopes over 72 percent (BMP 13.2). Landslide potential is high. Partial suspension will meet resource protection needs (BMP's 13.5, and 13.9). See Fish/Watershed section for streamcourse protection requirements (BMP 13.16).

Timber Input: Blind leads possible due to cliffs and benches pending final logging system/access location. Shift unit boundary to the road to the northeast, and combine with helicopter unit to the southwest to form one logical unit.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class IV, G/W, HC5 found along the northwest unit boundary. One Class IV, G/W, HC5 found ~mid-unit that becomes a class III, O/W, HC5 just below the proposed southwest unit boundary. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate wildlife use and a small avian nest in lower branches noted during silvicultural exam. NOGO surveys completed, 4/15/97, 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concerns as planned.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Suggest expanding to combine with lower elevation unit 581-449. This unit should also be expanded to the existing road. Combined stand exam information from two stands indicate between 115 and 136 TPA with Dq= 17-20" plus at least 16 snags/acre. Approximate minimum of 30 TPA occur in the 21"+ DBH class. Overall crown closure is 75%. Stem decays, defect and existing scattered windthrow are concerns. Partial harvest is feasible to meet S&G's with caution for windthrow. Target more sheltered areas (landforms) for retention and avoid wet areas. Use combined systems of clear cut with retention and individual tree selection or patch clear cut and group selection/it selection.

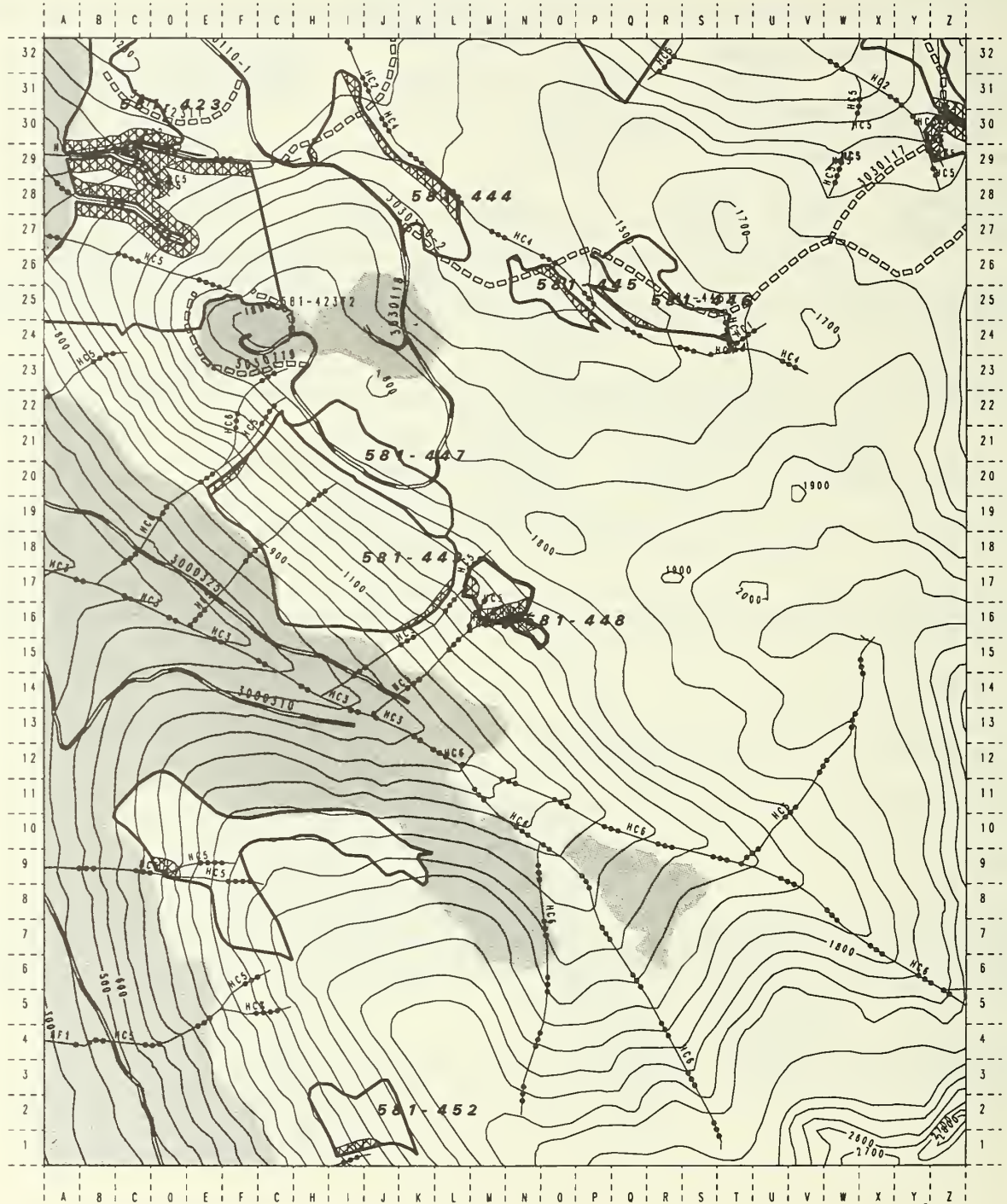
This unit as mapped, lies within portions of two stands in 58102.

Stand 56, 9 acres, has 22.858 MBF hemlock, 5.584 MBF spruce and 2.113 MBF yellowcedar for a total of 30.555 MBF per acre.

Estimates for stand 55, 4 acres, show 8.501 MBF hemlock, 1.391 MBF spruce and 4.54 MBF yellowcedar for a total of 18.292 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-448** Acres= **6.36**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-448 Planned Acres: 6.7 Estimated Volume: 51 MBF In Alternatives: 2, 3, 4, 6
 Silvicultural System : 4116/4152, 4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-7 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: SW
Volume class breakdown:	Class 4: 7		Class 5:	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Not Seen			VQO's:	Maximum Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams: 3		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 4- 7		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry stands throughout on slopes of 50 to 70 percent. Skunk cabbage in the understory in the lower part of the unit. Forested wetlands occupy 3 acres in the lower part of the unit. Partial suspension will meet soil and wetland protection requirements (BMP 12.5 & 13.9). A very small riparian area is associated with the southeast boundary stream. The entire riparian area is within the buffer (BMP 12.6). See Fish/Watershed section for stream-course protection requirements (BMP 12.6a and 13.16).

Timber Input: Unit 581-448 is planned to harvest 51 MBF of timber from 7 acres utilizing a helicopter logging system. The wood will be flown to a reconstructed road located approximately 0.5 mile to the west of the unit.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC5 found in the southeast portion of the unit requiring O/W protection. One Class IV, G/W, HC5 found along the northwest unit boundary. Two small Class IV, G/W, HC5 found in the lower southwest portion of the unit. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. No NOGO survey completed, unit did not meet NOGO survey protocol requirements. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concerns as planned.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability area for cultural resources.

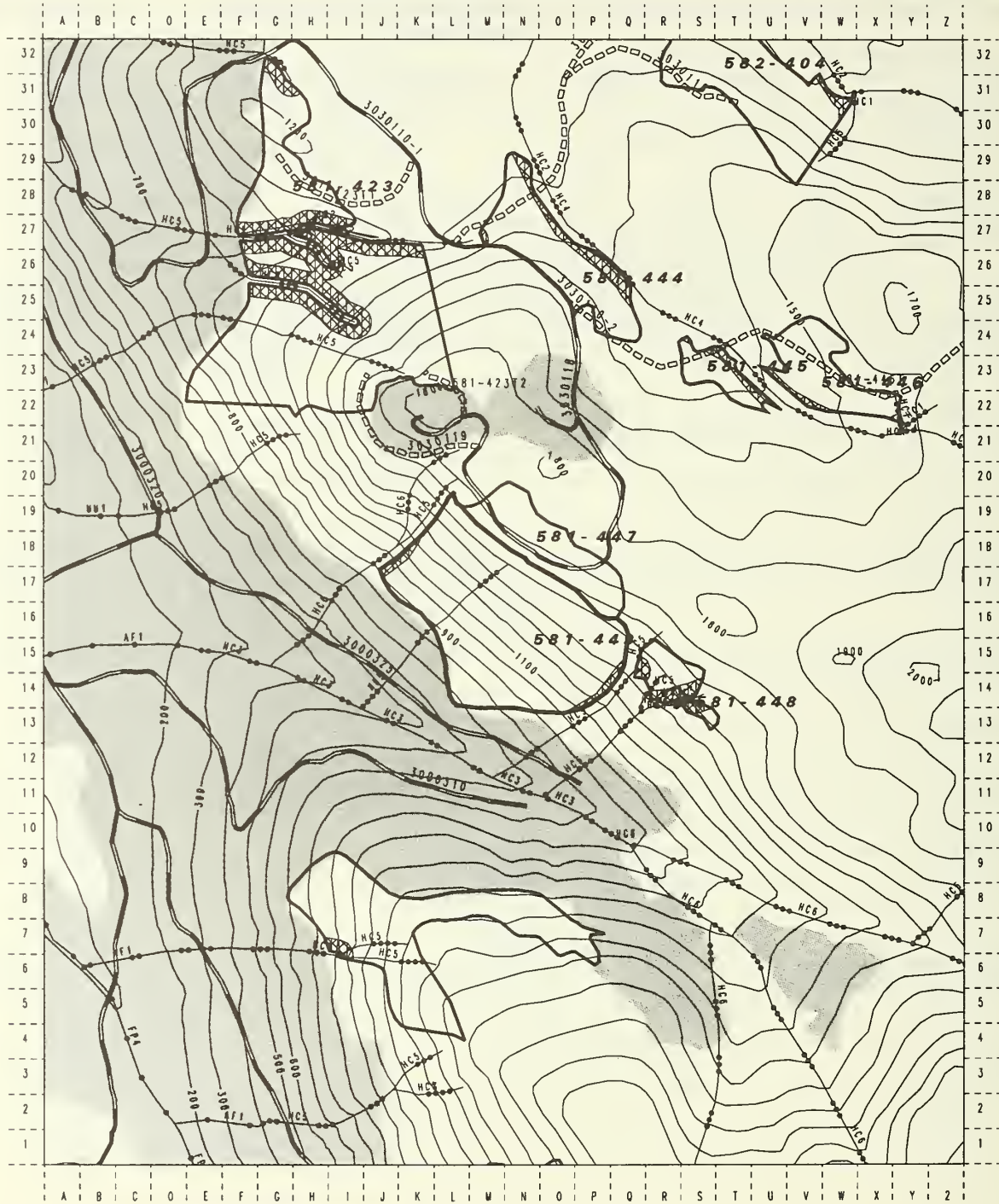
Geological Input: No concerns.

Silviculture Input: Lower volume class examined at 17 MBF/ac. Hemlock-yellowcedar with some spruce having about 55% canopy closure occurs. Stem decays, defects, cedar decline and light windthrow are among the concerns. 233 TPA with Dq=14" occurs along with 17 TPA dead. There are 16 TPA in the 21"+ DBH class. Partial harvest to meet S&G's is feasible using 4116 and 4152/4151 (clear cut with reserves and selection methods).

This unit lies within a portion of stand 58102-056 and has 8.047 MBF yellowcedar, 4.689 MBF hemlocks and 4.338 MBF spruce for a total of 17.074 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-449 Acres= 59.64**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-449	Planned Acres: 59.6	Estimated Volume: 834.4 MBF	In Alternatives: 2,3,4,6
Silvicultural System : 4114/4116/4152	Number of Settings:	Quad: Craig D-3 NE	Photo: 1090-7
WAA Number: 1420			Logging systems: HE

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type: Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect:
Volume class breakdown:	Class 4:	Class 5: 60	Class 6:	Class 7:	Low Productive
Scenery: Managed Viewshed:	Not Seen	VQO's:	Maximum Modification		
Recreation: Primary ROS Code	Roaded Modified				
Riparian MA: Class I Streams:	Class II Streams:	Class III Streams: 3	Class IV Streams:		
Soils:					
Mass movement Index: Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information: Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2-	3- 60 4-
High Value Habitat: Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-oak fern stands throughout unit. Soils are shallow to bedrock and similar to the Tolstoi and McGilvery soil series. Slopes are typically 60 to 80 percent but range up to 130 percent around the cliffs. Cliffs up to 40 feet high are common around 1,400 feet elevation. Approximately 10 acres on slopes over 72 percent. Slopes over 72 percent are scattered in short steep pitches around the cliffs and at lower elevations in the unit. Full suspension is required to meet resource objectives. Timber retention in small isolated areas along streamcourses in the southwestern part of the unit and below some of the cliffs is also required to meet soil protection objectives (BMP 13.5, and 13.9). Windthrow is a concern in most of the unit. Three water quality streams have identifiable riparian areas below the slope-break. All riparian areas will be within stream buffers (BMP 12.6). See Fish/Watershed section for streamcourse protection measures (BMP 12.6a and 13.16).

Timber Input: Blind leads possible due to small cliffs near top of unit. Recommend helicopter yarding.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC5 V-notch found along the north unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class III, O/W, HC5 ~mid-unit requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class III, O/W, HC5 found outside the southeast unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. Unit did not meet NOGO survey protocol requirements. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concerns as planned.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

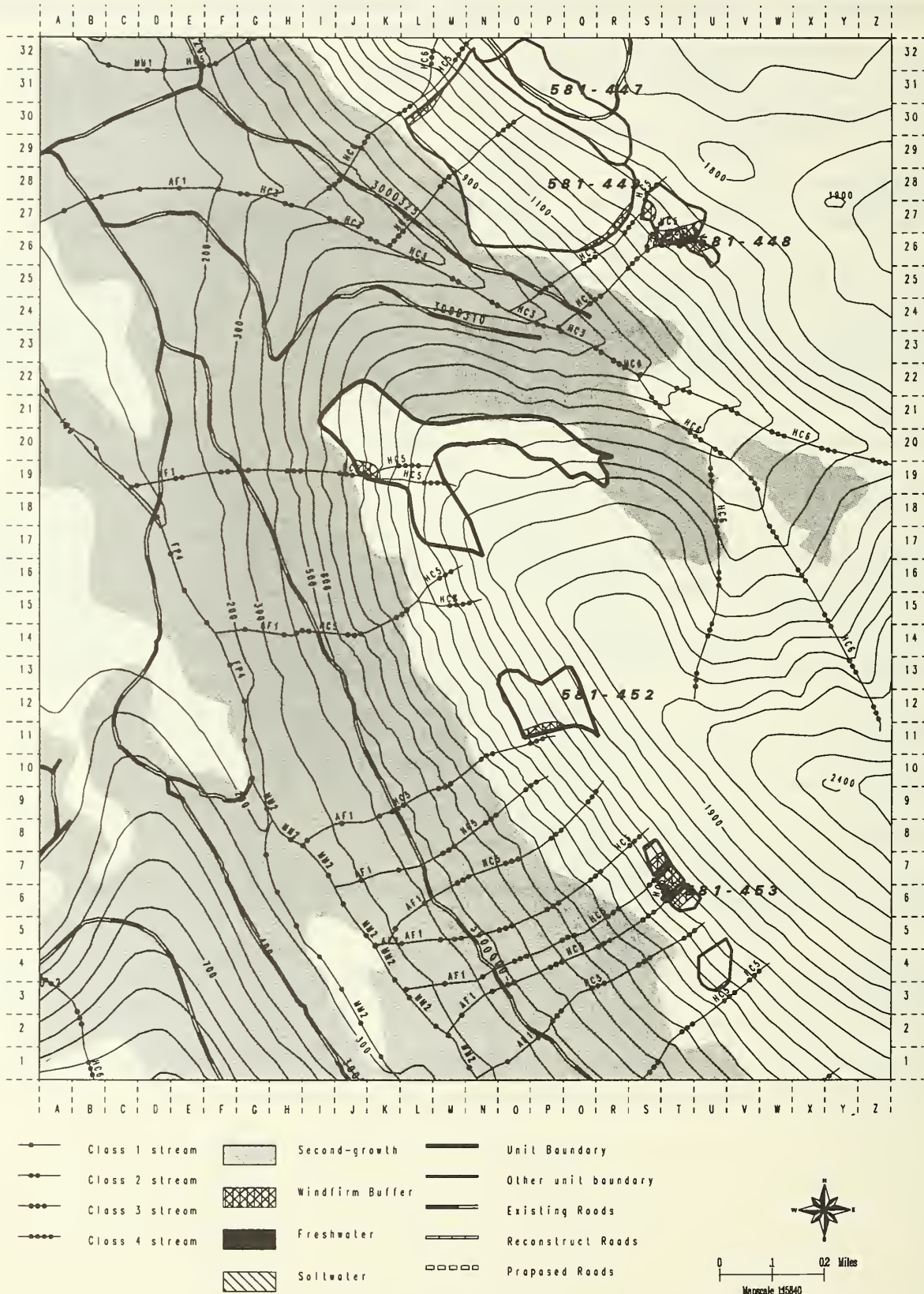
Geological Input: Karst areas of moderate vulnerability located within the unit boundary. Significant Karst features were deleted from LSTA unit during reconnaissance.

Silviculture Input: Exam of original configuration shows hemlock-yellowcedar with some redcedar and spruce. Patchy windthrow exists throughout. Minor decays and defects also exist. Exam shows 112 TPA with Dq=21" and 6 snags/ac. 31 TPA in 21"+ DBH class occur. No reason not to expand unit uphill and combine with unit 581-447. Partial harvest to meet S&G's is feasible using combined methods. Patch clear cut or clear cut with reserves, group selection and some individual tree selection are appropriate pending windthrow concerns.

This unit lies within a portion of stand 58102-055 and has 1.933 MBF redcedar, 16.147 MBF yellowcedar, 7.625 MBF hemlock and 2.627 MBF spruce for a total of 28.333 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-452 Acres= 48.87**

Mapscale 1:15840 (4 inch to Mile)



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-452 Planned Acres: 48.9 Estimated Volume: 876 MBF In Alternatives: 3,4,6
 Silvicultural System : 4114, 4116/4151 Number of Settings: Quad: Craig D-3 NE Photo: 1090-8 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: SW
Volume class breakdown:	Class 4:	Class 5:	Class 6: 49	Class 7:		Low Productive
Scenery:	Managed Viewshed:	Not Seen	VQO's:	Maximum Modification		
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 3	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2- 49	3- 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-oak fern stands on slopes less than 90 percent gradient. A fringe of forested wetlands occurs along the east unit boundary. Slopes over 72 percent were deleted following unit reconnaissance (BMP 13.5). Only short pitches remain. Full suspension is required for soil resource protection (BMP 13.5 and 13.9). Small riparian areas occur below the slope break on the larger streams. All riparian areas are within the no-cut buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection (BMP 13. 16 and 12.6a).

Timber Input: Helicopter log to existing road to the east.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Two Class III, O/W, HC5 streams that flow into one another at the clear-cut (west boundary) requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class III, O/W, HC5 stream found along the south unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm. Two Class IV, G/W, HC5 streams in south end of unit flowing west. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. NOGO surveys completed: 3/31/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Unit is obliquely visible from Luck Lake in the middle ground. Ridgeline partially screens the unit; partial harvest will mitigate impacts.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit is outside of high probability areas for cultural resources.

Geological Input: No concerns.

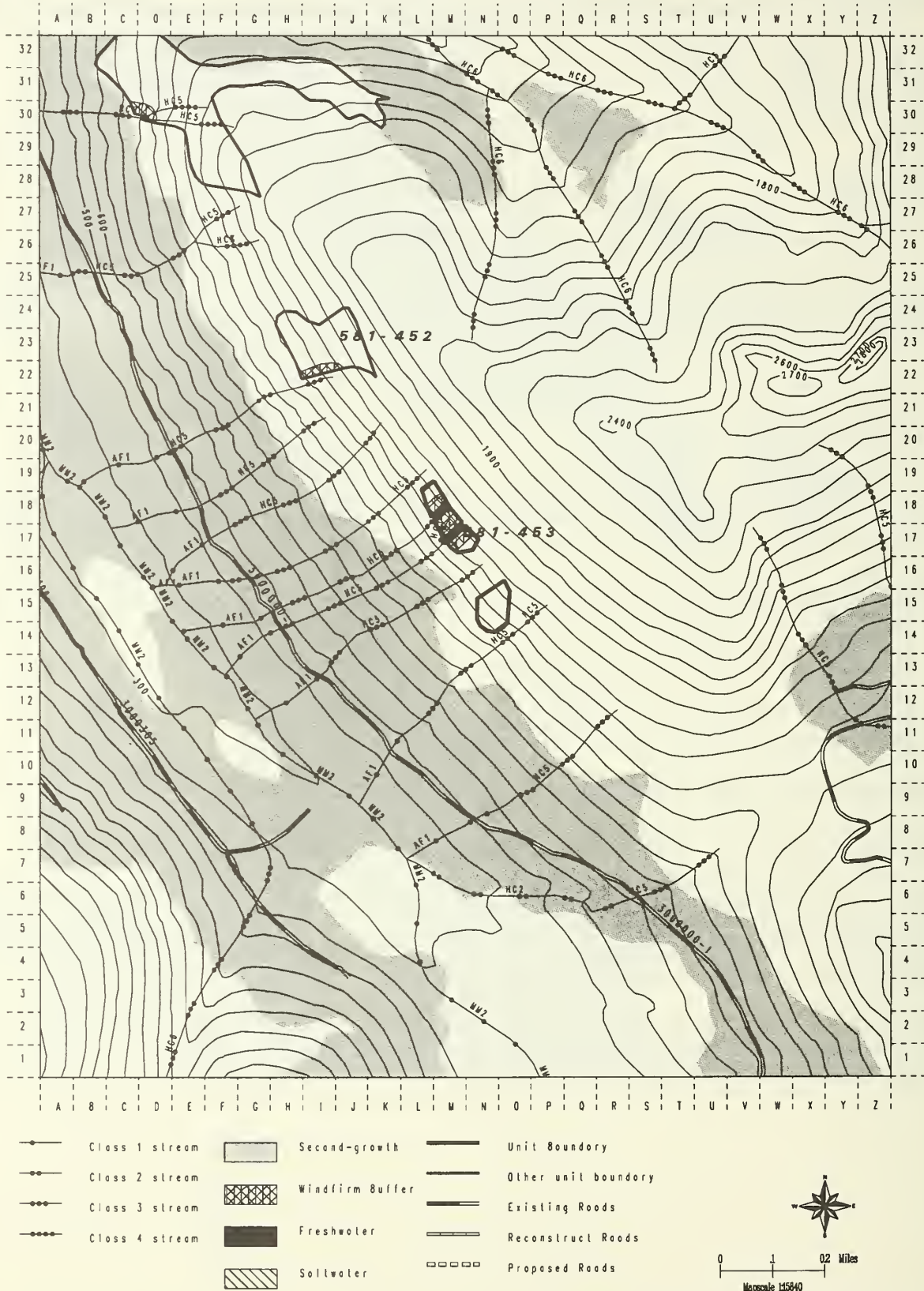
Silviculture Input: Some steep slopes, old slides and soil movement indicators present, especially in the S and W portions of the original configuration. Recommend deleting soil concerns and adding nose of ridge to N/NW. Highest volume is on riskiest soils/slopes. Majority of unit (new planned configuration) is Hemlock-yellowcedar with scattered spruce. Crown closure averages 70%. Potential wind damage risk is high for areas deleted and surrounding. Partial harvest is feasible to meet S&G's with cautions to wind damage potential. Use Patch clear cut or group selection (4114/4152) mixed with clear cut with reserves and individual tree selection (4116/4151) where wind hazards are highest.

This unit lies mostly within two stands in 58102 as originally mapped. Stand 66 is a minor component of the new configuration and stand 62 is the greater of the acreage in the new configuration.

Stand 66, 15 acres, has 59.693 MBF hemlock and 8.443 MBF spruce for a total of 68.136 MBF per acre.

Stand 62, 39 acres (original configuration), has 22.764 MBF hemlock, 4.537 MBF yellowcedar and 4.657 MBF spruce for a total of 31.957 MBF per acre.

Luck Lake Project Area Draft Unit Card: **581-453** Acres = **6.30**
 Mapscale 1:15840 (4 inch to Mile)



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-453 Planned Acres: 6.9 Estimated Volume: 142 MBF In Alternatives: 3,4,6
 Silvicultural System : 4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-8 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: SW
Volume class breakdown:	Class 4:		Class 5:	Class 6: 7	Class 7:	Low Productive
Scenery: Managed Viewshed:	Not Seen		VQO's: Maximum Modification			
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 5	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1-	2-	3- 4-
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-spruce-oak fern stands on slopes less than 72 percent gradient. Due to extremely landslide prone soils identified during unit reconnaissance, most of original unit 453 was not considered for timber harvest (BMP 13.5). Full suspension is required in portions of unit 453, and helicopter logging is planned (BMP 13.9). An area below the slope-break and on the headwall of the south boundary stream is a riparian area. The riparian area is entirely within the stream buffer or outside of the unit boundary (BMP 12.6). See Fish/Watershed section for streamcourse protection (BMP 12.6a and 13.16)

Timber Input: Much of the unit reconned is located over landslide prone soils and has been deferred. There are approximately 7 acres making up a helicopter setting that we can harvest meeting soils standards and guidelines.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Three Class III, O/W, HC5 V-notches found inside the unit (mid-1/3) requiring slope-break buffer and reasonable assurance of a windfirm buffer. Two Class III, O/W, HC5 V-notches found along the north and south proposed unit boundaries requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class IV, G/W, HC5 was identified in the NE unit area. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16. UNIT IS LOCATED UPSLOPE OF O&W STREAMS EXCEPT SE BOUNDARY 3/5/98 DJL

Wildlife Input: Moderate wildlife use indicated during silvicultural exam. NOGO surveys completed: 3/31/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: No concern as planned.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Much of the originally proposed unit configuration will be dropped due to soils concerns. Two small patches remain feasible for treatment (totaling about 7 acres) where hemlock-yellowcedar predominate. Windthrow remains a concern for any residual stand. Marten/Goshawk S&G's must be met and some retention for snow interception is desired to enhance regeneration development. 46 TPA with Dq=28" plus 10 TPA snags. There are 30 TPA in stems 21"+ Recommend grouping retention with clear cut and reserve system (4116).

This unit, as originally mapped, lies within a portion of stand 58102-062 which is estimated to have 22.595 MBF hemlock, 7.668 MBF yellowcedar and 4.097 MBF spruce for a total of 34.36 MBF per acre.

Mapscale 1:15840 (4 inch to Mile)



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Mapscale 1:5840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 581-461 Planned Acres: 4.4 Estimated Volume: 40 MBF In Alternatives: 3, 4, 6
 Silvicultural System : 4114/16/51/52 Number of Settings: Quad: Craig D-3 NE Photo: 1090-209 Logging systems: HE
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)
 Forest type: Cedar X Hemlock X Spruce Mixed Hem/Spr Nonforested Aspect: E
 Volume class breakdown: Class 4: 4 Class 5: Class 6: Class 7: Low Productive
 Scenery: Managed Viewshed: Alaska Marine Highway VQO's: Modification
 Recreation: Primary ROS Code Roaded Modified
 Riparian MA: Class I Streams: Class II Streams: Class III Streams: Class IV Streams:
 Soils:
 Mass movement Index: Low Medium High Very High Unknown Slopes Greater Than 72%
 Wetland Information: Wetland Mix Wetland Riparian Soil Site Productivity Classes 1- 2- 3-4 4-
 High Value Habitat: Sitka Black-Tail Deer- Marten- River Otter- Bald Eagle- Black Bear-
 Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-deer cabbage stand on slopes less than 70 percent gradient. Forested wetland in most of the unit. Full suspension is required throughout (BMP 13.5, 13.9 and 12.5). Water quality stream northeast of the unit has a riparian area below the slope-break. The riparian area is entirely outside the unit (BMP 12.6).

Timber Input: Unit 581-461 is planned to harvest 40 MBF of timber from 4 acres utilizing a helicopter logging system. The wood will be flown to the end of an existing spur road to be reconstructed approximately 1 mile to the south-east of the planned unit.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Fisheries recon found no streams in this unit. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16.

Wildlife Input: Unit did not meet NOGO survey protocol requirements. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Adjacent harvest impacts have pushed this viewshed to limits of acceptable change, consequently, minimize any additional visible impacts created by this harvest unit and road system. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

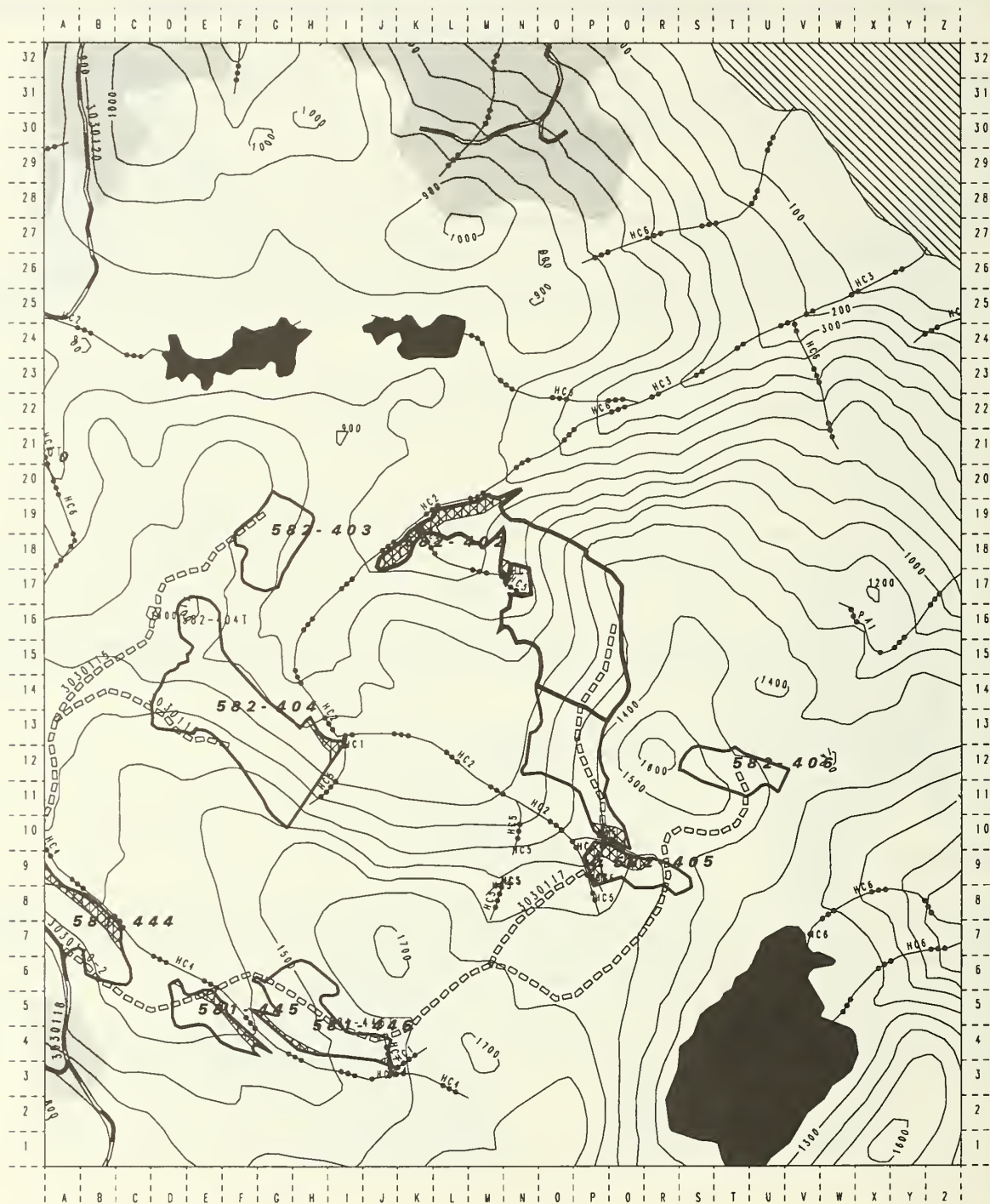
Geological Input: No concerns.

Silviculture Input: Exam data extrapolated. Could expand unit to treat majority of timber type. Appears forested wetland are present. yellowcedar decline is indicated from distance observations. Site index (50 year) by soils is 70. Windthrow concerns highly likely. Crown closure estimated at 65%. Clear cut with reserves recommended with some portions treated using selection methods (4116, 4151/4152 with 4114 acceptable). Regeneration objectives to maintain any spruce and cedar components while retaining at least sub-merchantable materials for future structure and snow interception for regeneration.

This unit did not receive a site visit but lies within stand 58103-041. Less than 5 acres, the stand is estimated to contain mostly yellowcedar with hemlock and occasional spruce. Timber type volume estimates indicate about 24 MBF per acre and extrapolated exam data suggests 40% yellowcedar by volume.

Luck Lake Project Area Draft Unit Card: **582-402 Acres = 39.75**

Mapscale 1:15840 (4 inch to Mile)



- | | | |
|----------------|-----------------|---------------------|
| Class 1 stream | Second-growth | Unit Boundary |
| Class 2 stream | Windfirm Buffer | Other unit boundary |
| Class 3 stream | Freshwater | Existing Roads |
| Class 4 stream | Saltwater | Reconstruct Roads |
| | | Proposed Roads |



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Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 582-402 Planned Acres: 38.2 Estimated Volume: 764 MBF In Alternatives: 4, 6
 Silvicultural System : 4116 Number of Settings: Quad: Craig D-3 NE Photo: 990-185 Logging systems: S
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: W
Volume class breakdown:	Class 4: 13		Class 5:	Class 6: 25	Class 7:	Low Productive
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's: Modification		
Recreation:	Primary ROS Code Roaded Modified					
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 25 3- 9 4- 4		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-spruce-blueberry and cedar-hemlock-blueberry stands on upland soils over most of the unit. Fringes of forested wetlands adjacent to the bogs east and west of the unit. Slopes range from 35 to 70 percent. Partial suspension is required to meet soil resource protection needs (BMP 13.9 and 13.5). No riparian areas identified within the unit. See Fish/Watershed section for streamcourse protection measures (BMP 12.6a and 13.16).

Timber Input: Recommend skyline logging with lateral yarding capabilities. Partial suspension required and achievable.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC3 stream found along the north unit boundary requiring a slope-break buffer and reasonable assurance of a wind-firm buffer. One Class IV, G/W, HC2/HC5 stream found along the north end of the west unit boundary with a Class IV G/W, HC5 flowing into it from the south. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5. Modify unit to meet Forest Plan Riparian Prescriptions. DJL ELJ 3/5/98

Wildlife Input: Moderate wildlife use noted during silvicultural exam. NOGO survey completed 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation use.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources

Geological Input: No concerns.

Silviculture Input: Small drains throughout the area. Cliffs present at SE end of original configuration. North end of original configuration most conducive to retention. This area has inclusions of less productive sites and clumpy distributions with canopy closure about 60%. Hemlock-yellowcedar mix with multiple canopy layers is common. The rest of the proposed unit is hemlock-spruce overstory with varying amounts of yellowcedar especially predominant near the upper and lower elevation fringes. Uniform distribution, tall straight stems of obvious windthrow origins, this central part of the proposed unit is productive (SI 80-100) and highly susceptible to wind damage. A proposed expansion to the south would adjoin proposed unit 582-405 and is composed of mostly volume class 5 in hemlock, yellowcedar and spruce. The area shows indications of past windthrow in patchy distributions. Some mix of silvicultural systems may be appropriate in this area with caution paid to wind disturbance risks. Recommend clearcut with reserves for the majority of the proposed unit. Some patch clear cut and selection is feasible at either end where wind risk is not uniformly high. This unit has been reconfigured and acreage estimates are approximate. The unit has been expanded to the SW. No hard exam data was collected during the silvicultural site visit other than a few BA plots and observations.

Stand 58201-071, 10 acres approx., is about 50% hemlock, 40% yellowcedar and 10% spruce. BA is around 400 sq. ft./ acre and stand height ranges from 70 to 90 feet with patches of older windthrow and decadence.

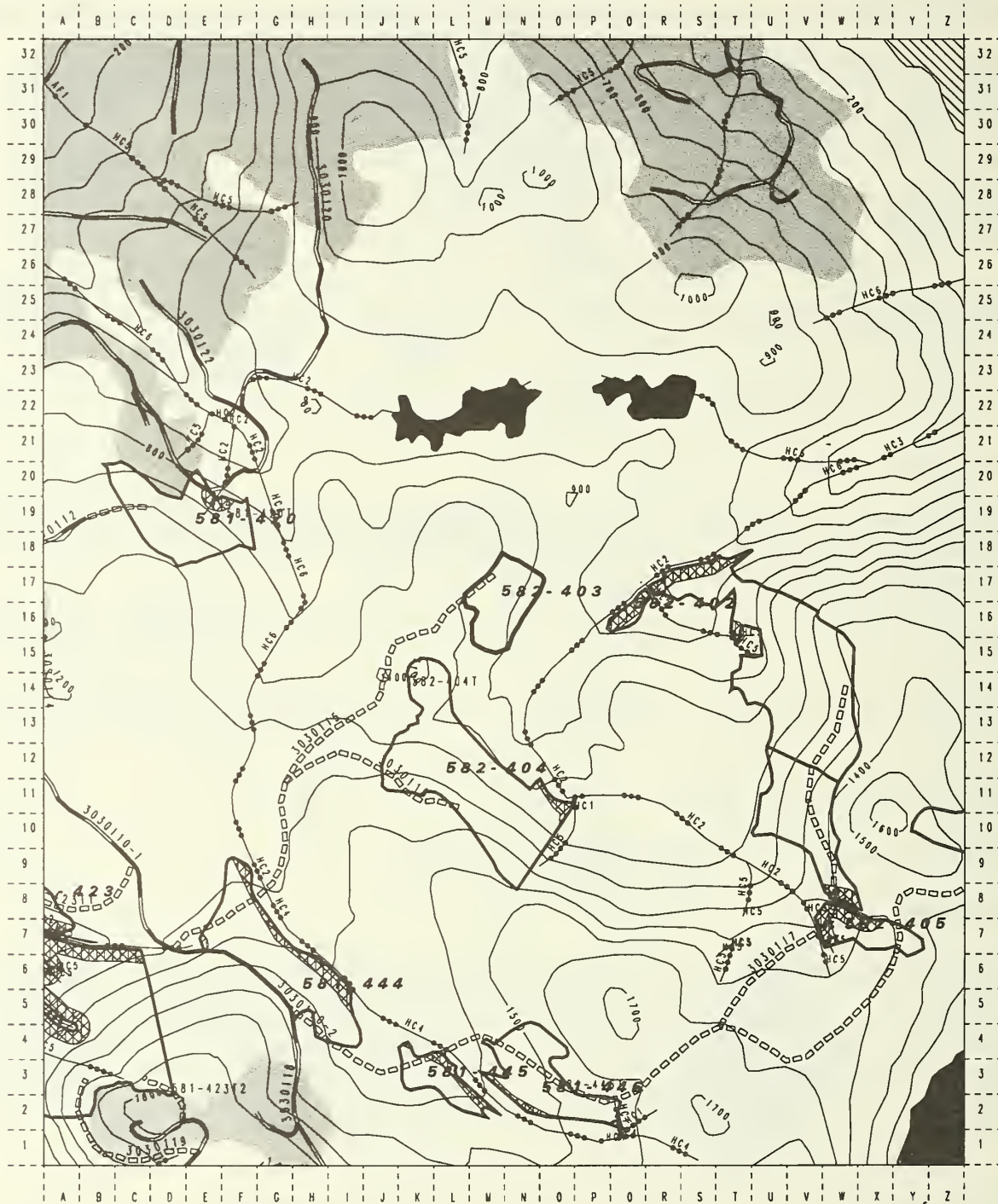
Stand 009, 10 acres approximate, is a hemlock-spruce mix of windthrow origin. Estimated 50-60% hemlock and spruce with scattered yellowcedar, BA is about 360 sq. ft./acre and stand height is about 100-110 feet. A guess at average diameter is about 24".

Stands 112, 065 and 060 are similar. Approx. 25 acres and has approximately 20% yellowcedar, 30% spruce and 50% hemlocks with BA between 360 and 400, an average diameter of about 16" and stand height between 90 and 110".

The most northerly portion of the planned unit is lower volume (estimate 20-24 MBF/acre with about 400 sq. ft./acre BA, average diameter of about 15", stand height of about 70 feet and composed of about 50% yellowcedar, 40% hemlocks and 10% spruce.

Luck Lake Project Area Draft Unit Card: 582-403 Acres= 9.35

Mapscale 1:15840 (4 inch to Mile)



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|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



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Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 582-403 Planned Acres: 9.4 Estimated Volume: 118 MBF In Alternatives: 4, 6
 Silvicultural System : 4116 Number of Settings: Quad: Craig D-3 NE Photo: 1090-5 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect: S/SE
Volume class breakdown:	Class 4:	Class 5:	Class 6:	Class 7:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams:	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72 %
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 4-	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry stands with skunk cabbage forested wetlands on the fringes of the unit. St. Nicholas soils with Kitkun soil on the fringe of the unit. Unit 403 is surrounded by non-forested bogs. Slopes range from 20 to 50 percent. Partial suspension is required to meet soil and wetland protection needs (BMP 12.5 and 13.9).

Timber Input: Unit expanded to NE to treat majority of timber stand, running skyline recommended.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: Fisheries recon found no streams in this unit. Stream occurs south of proposed unit configuration. Apply BMP's 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate wildlife use noted and sign observed during silvicultural exam. NOGO survey completed 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Possible future trail could be located along the access road (3030110) to this unit. Trail would access Baird Lake 6000' SE of unit and alpine peaks in surrounding area. Road also passes by two smaller lakes N of unit near intersection of 3030112 that have additional recreation value.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

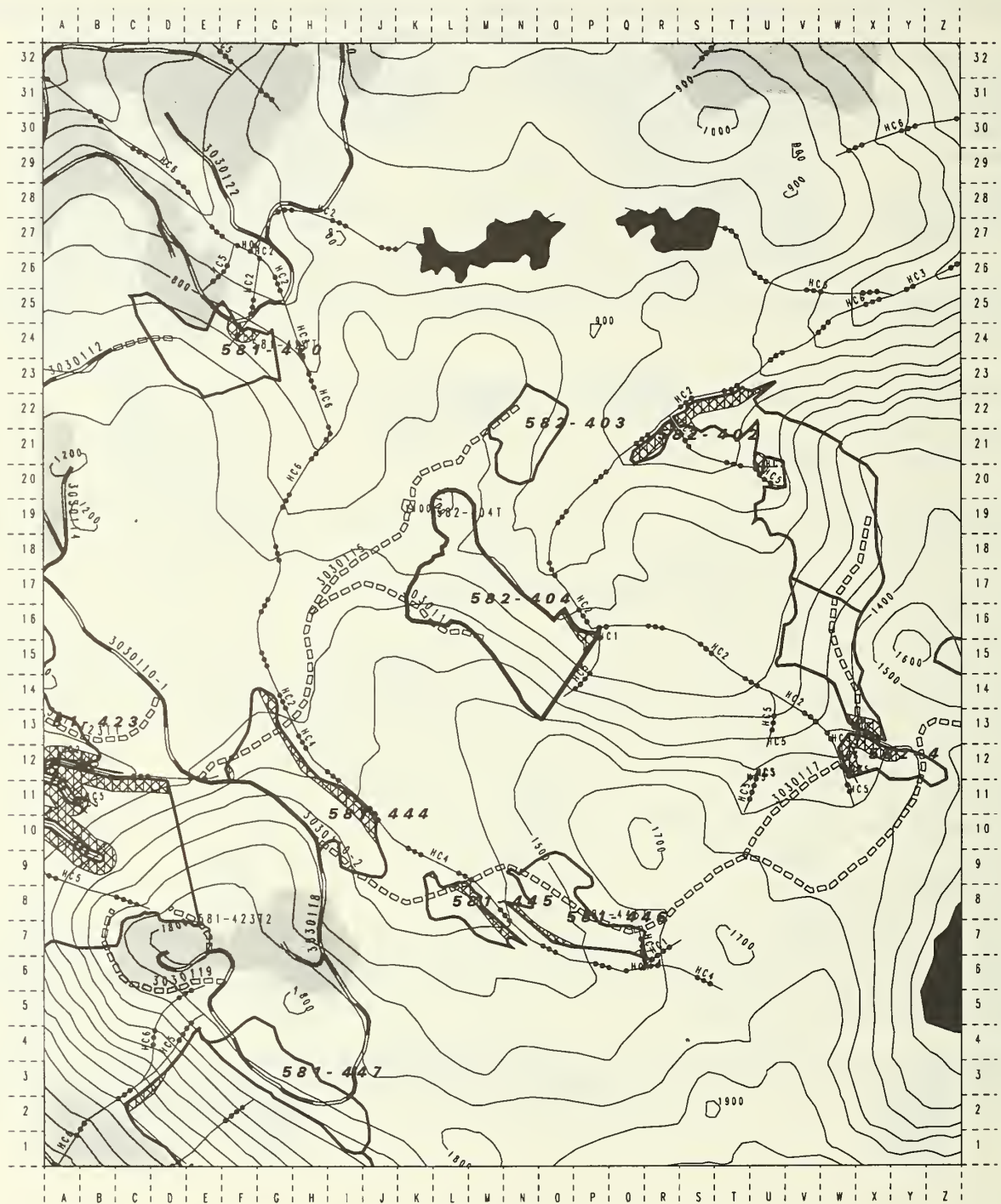
Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: No concerns.

Silviculture Input: Original unit configuration should be expanded to treat the majority of the timber type within the VCU. Hemlock-yellowcedar with some spruce near the western extreme, this stand is high risk to windthrow, especially on wetter sites. Average canopy closure is 70% with patches of windthrow on some of the forested wetland sites where overstory is only 20% closed and a second canopy layer in the understory approached 70% closure. Partial harvest is feasible using patch clear cut and selection methods (4114/4152) but clear cut with reserves (4116) is preferred to encourage spruce and cedar regeneration and minimize windthrow risk to any residual stems.

As mapped, this unit lies within stand 58201-062 and is a hemlock-yellowcedar stand with varied BA from 440 to 600 sq. ft. per acre. Some large stems exist and composition is estimated to be 5% spruce, 55% yellowcedar and 40% hemlock. A wide range of diameters exist and stand height is about 85 feet, average.

Luck Lake Project Area Draft Unit Card: **582-404 Acres= 32.99**
 Mapscale 1:15840 (4 inch to Mile)



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|--------------------|------------------|-----------------------|
| —●— Class 1 stream | □ Second-growth | — Unit Boundary |
| —●— Class 2 stream | ▤ Windfirm Butte | — Other unit boundary |
| —●— Class 3 stream | ■ Freshwater | — Existing Roads |
| —●— Class 4 stream | ▨ Saltwater | — Reconstruct Roads |
| | | □□□ Proposed Roads |



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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 582-404 Planned Acres: 33 Estimated Volume: 396 MBF In Alternatives: 4, 6
 Silvicultural System : 4116 Number of Settings: 4 Quad: Craig D-3 NE Photo: 1090-5 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce X	Mixed Hem/Spr	Nonforested	Aspect: NE
Volume class breakdown:	Class 4: 20		Class 5: 13	Class 6:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 2	Class IV Streams: 1		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 13 3- 20 4-		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry-skunk cabbage and hemlock-spruce-blueberry stands on slopes from 20 to 75 percent gradient. About 1 acre on slopes over 72 percent. The Kitkun and Kaikli soils in the north half of the unit are to be deferred from timber harvest until the results of the Forested Wetlands study (BMP 12.5). Upland soils in the southeastern half of the unit are suitable for timber harvest with partial suspension (BMP's 13.9 and 13.5). Riparian areas occur below the slope-break on two small V-notches. The riparian areas are entirely within the no-cut buffer (BMP 12.6). See Fish/Watershed section for streamcourse protection measures (BMP 12.6a and 13.16). .

Timber Input: Current unit configuration calls for the harvest of 396 MBF on 33 acres utilizing a running skyline type of logging system. Lateral yarding to corridors will be required on this unit primarily to meet VQO as seen from Clarence Straight.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, MM1/HC2 found along the east end of the northeast unit boundary requiring 120 ft. no-cut buffer and reasonable assurance of a windfirm buffer for the MM1 section and a slope-break buffer and reasonable assurance of a windfirm buffer for the HC2 section. One Class III, O/W, HC5 found that flows into the above stream in the northeast corner of the unit requiring a slope-break buffer and reasonable assurance of a windfirm buffer. One Class IV, G/W, HC2/HC5 found ~mid-unit flowing northeast through the NE unit boundary. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.7.

Wildlife Input: Moderate wildlife use noted during silvicultural exam. NOGO survey completed 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Possible future trail could be located along the access road (3030110) to this unit. Trail would access Baird Lake 1500' SE of unit and alpine peaks in surrounding area. Road also passes by two smaller lakes N of unit near intersection of 3030112 that have additional recreation value.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

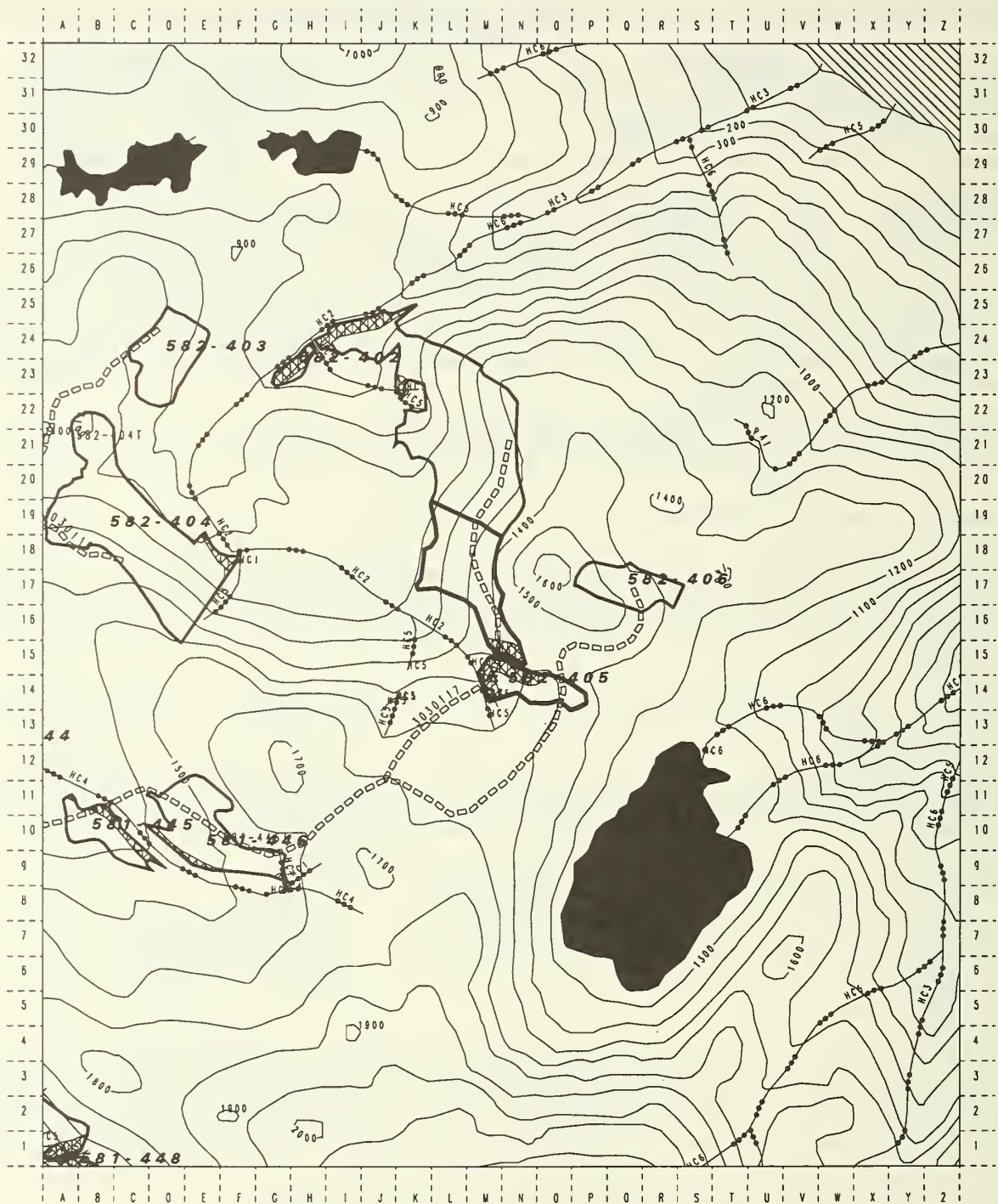
Geological Input: No concerns.

Silviculture Input: Delete S 1/2 of original unit configuration due to slides, slopes and karst concerns. Wind stability is questionable. Higher elevations composed of hemlock-spruce with some yellowcedar. Crown closure about 60% and site index 80-100. Lower elevations and norther portion is much less productive site index 50-60 with 40% crown closure in hemlock-yellowcedar with some spruce. Cedar decline and decays are common along with physical defects. Average diameter (Dq) = 17". 123 TPA over most of the unit with 30 TPA in stems 21"+. Partial harvest feasible using patch clear cut and selection combination methods (4114/4152) but clear cut with reserves (4116) is preferred to encourage spruce and cedar regeneration and minimize residual loss to wind.

As currently mapped, this unit lies mostly within two stands in 58201. Only one stand was sampled and volumes are higher on the upslope portion of the reconfigured unit. The souther portion of the original configuration was dropped due to karst and soils concerns. Stand 068, approximately 20 acres, has 1.234 MBF hemlock, 1.363 MBF spruce and about 12.306 MBF yellowcedar for a total of 14.9 MBF per acre. Stand 069 was not sampled. Estimated acreage in the new configuration is about 10 and the stand appears to have a higher hemlock and spruce component that stand 068. BA is probable about 360 with 40% hemlock, 15% spruce and 35% yellowcedar. Estimated height is 80 to 90 feet. These are conservative estimates.

Luck Lake Project Area Draft Unit Card: **582-405** Acres= **20.57**

Mapscale 1:15840 (4 inch to Mile)



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|--------|----------------|--|-----------------|---|---------------------|
| —●— | Class 1 stream | | Second-growth | — | Unit Boundary |
| —●●— | Class 2 stream | | Windfirm Buffer | — | Other unit boundary |
| —●●●— | Class 3 stream | | Freshwater | — | Existing Roads |
| —●●●●— | Class 4 stream | | Saltwater | — | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

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Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 582-405 Planned Acres: 21 Estimated Volume: 369 MBF In Alternatives: 4, 6
 Silvicultural System : 4116 Number of Settings: 2 Quad: Craig D-3 NE Photo: 1090-5 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock X	Spruce	Mixed Hem/Spr	Nonforested	Aspect:
Volume class breakdown:	Class 4:	Class 5:	Class 6:	Class 7:	Class 7:	Low Productive
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams: 2		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity	Classes 1- 2- 3- 21 4-	
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Hemlock-blueberry and cedar-hemlock-blueberry stands on slopes less than 50 percent gradient. Forested wetlands mixed with upland soils. Some Kitkun soils in the unit. Partial suspension is required to protect wetlands and soils (BMP 12.5 & 13.9). Karst features in the northwest end of the unit. Riparian areas occur below the slope-break on streams west and northeast of the unit. The riparian areas are in the buffers or outside the unit (BMP 12.6). Unit 405 was modified following reconnaissance to avoid karst features, streams and scrub-shrub forested wetlands (BMP 13.2). See Fish/Watershed section for streamcourse protection measures (BMP 12.6a and 13.16).

Timber Input: Drop/defer lower portion of original configuration (SE portion), a low volume stringer with difficult access and yarding.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, O/W, HC5 found along west unit boundary requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Two Class IV, G/W, HC5 streams were identified with one flowing into the west Class III channel and one found along the N/NW unit boundary. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Wildlife sign noted as moderate to heavy during silvicultural exam. NOGO survey completed 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. Possible future trail could be located along road (3030110) above this unit. Trail would access Baird Lake adjacent to this unit and alpine peaks in surrounding area.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

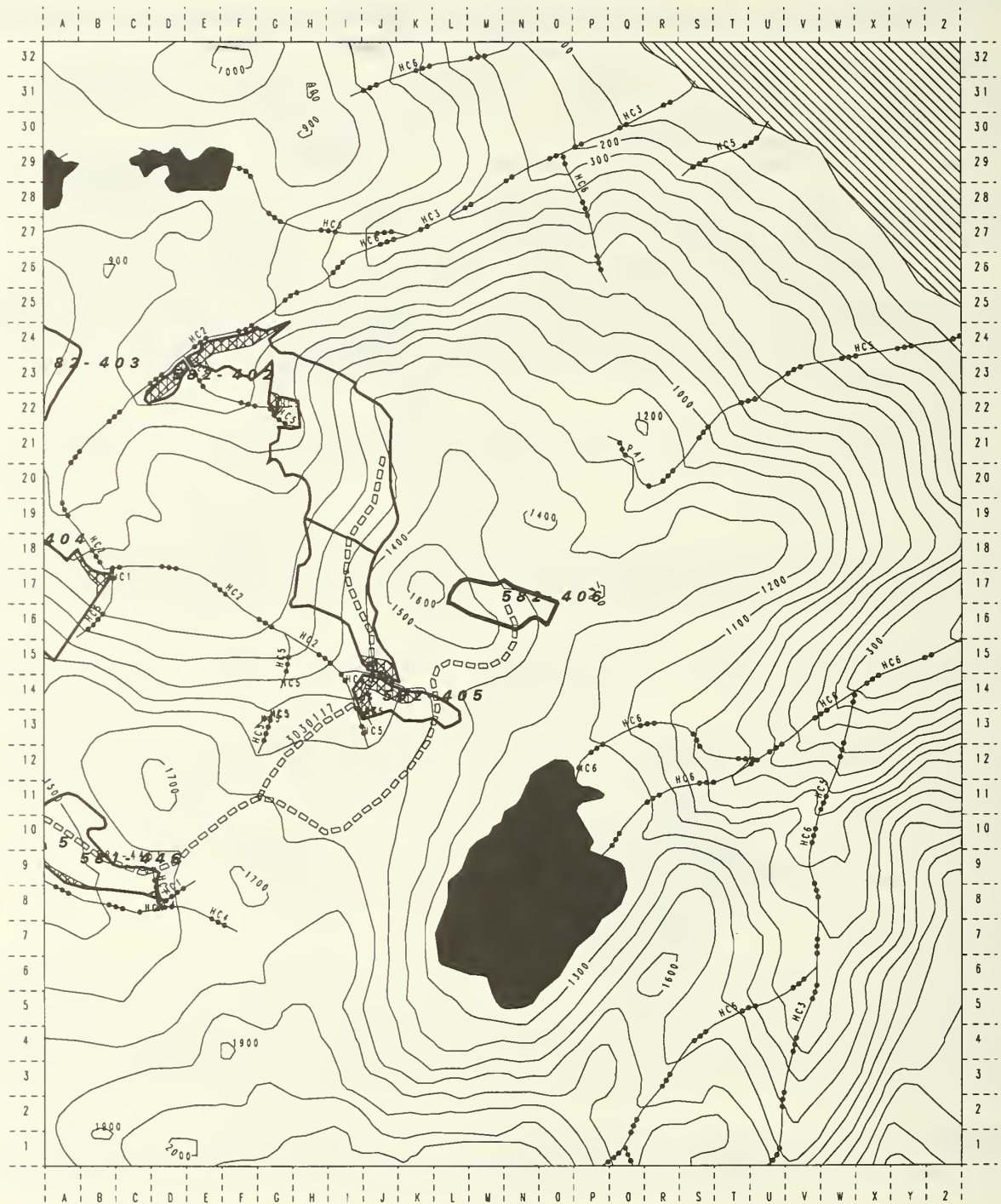
Geological Input: No concerns.

Silviculture Input: Drop lower (SE) finger of original unit configuration at stand type break. Marginal timber occurs there, low timbered acreage and difficult access. Remainder of proposed unit is Hemlock-yellowcedar with some large spruce scattered throughout. BA is 440 and canopy is nearly closed (80-90%). High defect, decay and evidence of historic windthrow are present. Patchy windthrow present where canopy closure lowers to 65% and smaller stems are abundant in N part of original unit configuration. Partial harvest is feasible using individual selection and patch clearcut combination but prefer clearcut with reserves leaving submerchantable stems to provide some future structure and light snow interception for regeneration while maintaining open conditions to encourage spruce and cedar regeneration.

Walk through exam with BA plots was conducted. As mapped and reconfigured, the unit lies within stand 58201-109 which has an average BA of 400 sq. ft. per acre and diameter varies widely with some large stems occurring. Stand height is only about 80 feet and is estimated at 20% spruce, 20% yellowcedar and 60% hemlock. Volume class is shown as 6 but may be VC5 due to high decadence.

Luck Lake Project Area Draft Unit Card: **582-406 Acres = 6.72**

Mapscale 1:15840 (4 inch to Mile)



- | | | | | | |
|--|----------------|--|-----------------|--|---------------------|
| | Class 1 stream | | Second-growth | | Unit Boundary |
| | Class 2 stream | | Windfirm Buffer | | Other unit boundary |
| | Class 3 stream | | Freshwater | | Existing Roads |
| | Class 4 stream | | Saltwater | | Reconstruct Roads |
| | | | | | Proposed Roads |



0 1 0.2 Miles
Mapscale 1:15840

07/23/98 / tsfiles/ref/library/gis/luck/unitcard/unitcard.doc.mtl

Luck Lake DEIS - Unit Data Card - Planned Configuration

Unit: 582-406 Planned Acres: 7 Estimated Volume: 80 MBF In Alternatives: 4, 6
 Silvicultural System : 4116 Number of Settings: 1 Quad: Craig D-3 NE Photo: 1090-5 Logging systems: RS
 WAA Number: 1420

Physical Description

(Numbers are Acres unless otherwise noted)

Forest type:	Cedar X	Hemlock	Spruce	Mixed Hem/Spr X	Nonforested	Aspect: W
Volume class breakdown:	Class 4:	Class 5: 7	Class 6:	Class 7:	Low Productive	
Scenery:	Managed Viewshed: Alaska Marine Highway			VQO's:	Modification	
Recreation:	Primary ROS Code	Roaded Modified				
Riparian MA:	Class I Streams:	Class II Streams:	Class III Streams: 1	Class IV Streams:		
Soils:						
Mass movement Index:	Low	Medium	High	Very High	Unknown	Slopes Greater Than 72%
Wetland Information:	Wetland	Mix Wetland	Riparian Soil	Site Productivity Classes 1- 2- 3- 7 4-		
High Value Habitat:	Sitka Black-Tail Deer-	Marten-	River Otter-	Bald Eagle-	Black Bear-	

Data derived from digital geographic data. The coverages may not have met National Map Accuracy Standards.

Soils Input: Cedar-hemlock-blueberry stand on poorly and somewhat poorly drained soils. Most of unit is forested wetland. Unit 406 is surrounded by non-forested bogs. Slopes are less than 50 percent. Partial suspension is required for soil and wetland protection (BMP's 12.5 and 13.9). Unit 406 was modified following reconnaissance to avoid the V-notch southeast of the unit (BMP 13.2). The riparian area on the V-notch stream is entirely outside the unit (BMP 12.6). See Fish/Watershed section for streamcourse protection measures (BMP's 12.6a and 13.16).

Timber Input: Lower portion of original unit configuration dropped/deferred due to poor timber and yarding difficulties. The current unit configuration would harvest 80 MBF of timber from 7 acres of land utilizing a small running skyline system with lateral yarding capabilities.

Engineering Input: See attached road card in Appendix C.

Fish/Watershed Input: One Class III, Orange/White, HC6 found outside the east unit boundary flowing out of the lake and requiring a slope-break buffer and reasonable assurance of a windfirm buffer. Fisheries recon found no other streams in this unit. Apply BMP's 12.6 and 12.6a, 13.9, 13.10, 13.11, 13.12 and 13.16, 14.3 and 14.5.

Wildlife Input: Moderate to high levels of browse and sign observed. NOGO survey completed 7/3/97. Implement marten and goshawk S&G's to retain => 30% canopy closure.

Recreation/Scenery Input: Design tree clumps and skyline corridors (if used) to minimize or eliminate the appearance of straight lines or geometric shapes. No established recreation.

Lands Input: No state/private or encumbered lands occur adjacent to unit.

Cultural Resource Input: Unit outside of high probability areas for cultural resources.

Geological Input: Karst present. Small cave located along fault line stream near NW end of unit just outside unit configuration. Dry karst drains are present in the central portions of the unit configuration.

Silviculture Input: Retention is possible. Most wind damage observed is breakage with windthrow occurring in patches on wetter sites. Poor timber and low acres in SE stringer which should be dropped/deferred. Remainder of unit is Mixed Hemlock-yellowcedar-Spruce. Regeneration objectives to encourage spruce and cedar using clear cut with reserves. Retain submerchantable stems to provide some future structure and snow interception for regeneration (Silv system 4116). Other silviculture systems available include patch clear cut with reserves (4116/4114) and mixed group and individual selection methods (4151/4152).

This unit lies within stand 58201-108 and has about 380 sq. ft. of BA with about 70% hemlock, 10% spruce and 15% yellowcedar. Diameter varies widely with some large stems present and about 28 MBF/acre or less due to decadence.

NOTES

Appendix

C

Road Cards

017-111111

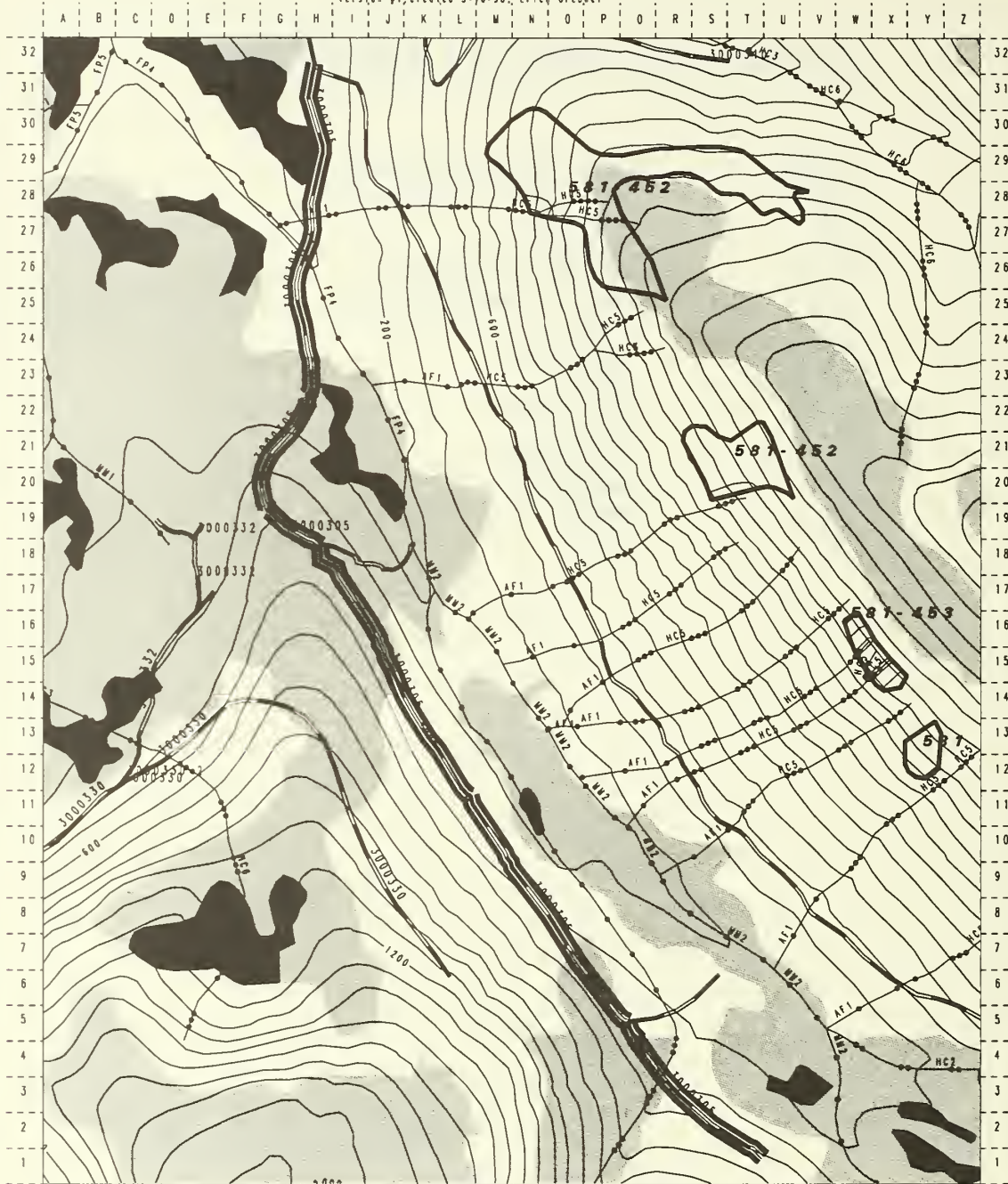
017-111111

Acronymns Used on Road Cards

ADF&G	Alaska Department of Fish and Game
AHMU	aquatic habitat management unit
B/W	blue/white
BF	bank full
BMP	Best Management Practice
CFR	Code of Federal Regulations
E	east
G/W	green/white
MP or M.P.	mile post
M.P.H	miles per hour
N	north
N/A	not applicable
O/W	orange/white
S	south
W	west

Luck Lake Project Area Draft Road Card 3000305

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



- | | | |
|------------------|-----------------------|-----------------------|
| — Class 1 Stream | ▨ Salt Water | — Existing Roads |
| — Class 2 Stream | □ Fresh Water Lakes | — Reconstructed Roads |
| — Class 3 Stream | ■ High Value Wetlands | — Proposed Roads |
| — Class 4 Stream | □ Other Wetlands | — Selected Road |
| — Unit Boundary | | |

05/01/98 PAGE 1
Miles
Road Number Miles
3000305 2.28
===== 2.28

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3000305</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>2.28</u>	
<u>N/A</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>2.28</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>N/A</u>	Post Sale <u>1</u>

Intended Purpose and Use:

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:	
Accept:	
Discourage:	
Eliminate:	Road is currently closed by alder growth and a pulled bridge. Placed in storage.
Prohibit:	
Closure Devices:	Organic and pulled bridge.

Travel Management Narrative: No short or long term use anticipated. Road is regenerated by alder growth.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is alder covered and bridge is pulled. There are no known erosion problems with this road. Maintain existing alder cover (BMP 14.8).

Road Location Narrative:					
Existing Road .					
Wetlands Avoidance:					
Existing road.					
Rock Pits:					
Stream Crossings:					
One Class I, One Class IV O/W stream crossing based on GIS. The stream crossings listed below are from beginning to end of existing road.					
A) MP unknown	AHMU	Class I	Channel Type FP4	BF width	BF depth
Gradient %	Structure	Passage Yes	Timing dates: 7/18 to 8/15	Substrate:	
Narrative: This is SE Fork Luck Creek, ADF&G # 106-10-10300-0010-2070-3001.					
B) MP unknown	AHMU	Class IV	Channel Type HC6	BF width	BF depth
	O/W				
Gradient %	Structure	Passage No	Timing dates: 7/18 to 8/15	Substrate:	
Narrative: Water quality stream; Close proximity to Class I habitat.					

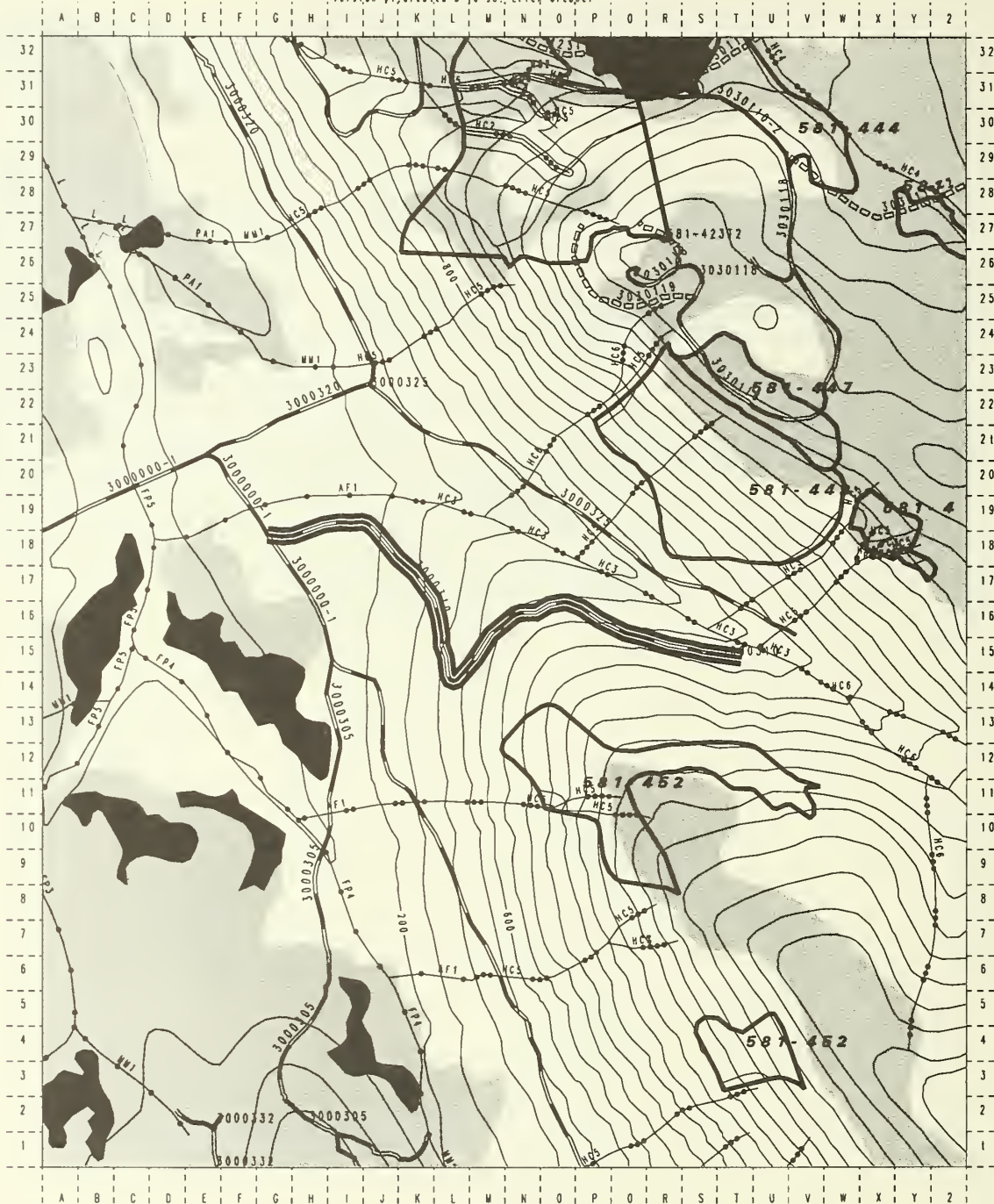
Road #: 3000305	Map #: Craig D-3 NE	Aerial Photo: Yr. 91 Line 27N	Photo #'s: 1090-108, 109
		Aerial Photo: Yr. 91 Line 28N	Photo #'s: 1090-8, 9

NOTES

Luck Lake Project Area Draft Road Card 3000310

Mapscale 1:15840 (4 inch to Mile)

Version 11, Created 3-10-98, Erich Grebner



- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Class 4 Stream
- Unit Boundary
- Salt Water
- Fresh Water Lakes
- High Value Wetlands
- Other Wetlands

- Existing Roads
- Reconstruct Roads
- Proposed Roads
- Selected Road

05/01/98 PAGE 1

Miles

Road Number Miles

3000310

1.10
=====

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3000310 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 1.10

N/A Construction (New or RE) Beginning M.P. 0.00 Length 1.10

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT
 Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1
 Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:	
Accept:	
Discourage:	
Eliminate:	Close the road at the beginning of the road. Leave pipes, and construct water bars upgrade of the pipes , clean ditches and reseed the cut slopes.
Prohibit:	
Closure Devices:	Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Road may be used for future helicopter access. Close to reduce maintenance.

Design Narrative Information:

Existing road 14' wide; Design speed 10 MPH; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3000000-1).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

The 3000310 road is needed to provide a helicopter landing for units 581-448 and 449. The landing at the end of the road has been used as a helicopter landing in the past and the accumulation of slash could be substantial. Keep slash out of live streams BMP 14. 12 & 14.19. Clean inside ditch after harvest, grass seed cutslopes and establish water bars upstream of culverts BMP's 14.5, 14.8, 14.12, 14.20. Discourage vehicular access by waterbarring and ripping 100 feet of road surface at point of beginning BMP 14.20, and 14.22.

Road Location Narrative:				
Existing Road serves as helicopter access for harvesting Unit 581-448 and 449.				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
One Class IV O/W stream crossing based on GIS. The stream crossings listed below are from the beginning to the end of the existing road.				
A) MP: unknown	AHMU: Class IV O/W	Channel Type HC6	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Class II stream approximately 100-200 ft. downstream.				

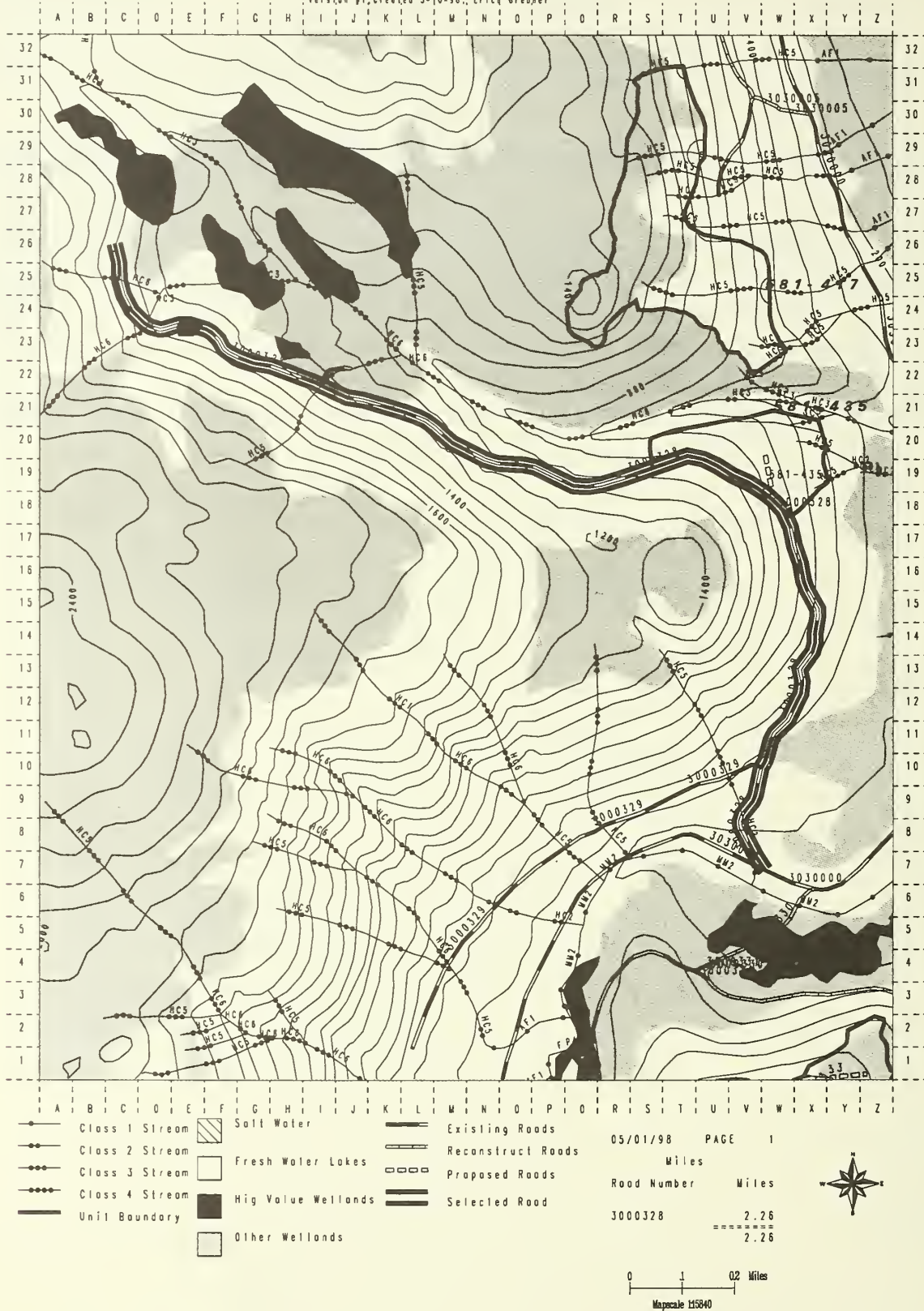
Road #: 3000310 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 27N

Photo #'s: 1090-105,106

NOTES

Luck Lake Project Area Draft Road Card 3000328

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3000328 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 2.26

N/A Construction (New or RE) Beginning M.P. 0.00 Length 2.26

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 1,2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at beginning of road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Area has high slide potential. Close road and remove pipes to eliminate potential for plugging pipes and road wash outs.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

Accesses unit 581-435.

Silviculture:

Future access for cultural treatments will be limited or may be prohibitively expensive. Majority of treatment needs can be accessed from mainline 3030000 road.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

The existing 3000328 road was identified as a sediment source in the watershed analysis. The 3000328 road is a high maintenance road (BMP 14.20) and is proposed for a FPA style closure BMP 14.22 and 14.24). Culverts prone to plugging should be pulled and cutbanks allowed to reach a natural angle of repose. Grass seeding should be accomplished during closure and in subsequent years if necessary to stabilize exposed soils (BMP 14.8). Avoid sidecast of excavated material in the forested wetland or small bog between the clearcuts (BMP's 12.5, 14. 12, and 14.19). Keep open and maintain the 3000328 up to harvest unit 581-435 to provide salvage opportunities (BMP 14.22). Timing may be required for closure activities (BMP 14.6) see fisheries section.

Road Location Narrative:

Existing Road accesses unit 581-435.

Wetlands Avoidance:

Existing road.

Rock Pits:**Stream Crossings:**

There are two B/W Class II, and three O/W Class IV stream crossings on this road based on GIS. The information contained below is for the reconstructed road from beginning to end of existing road.

A) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Class IV O/W upstream; Class II downstream; close proximity to catalogued habitat for steelhead.					
B) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Close proximity to catalogued habitat for steelhead.					
C) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Close proximity to catalogued habitat for steelhead.					
D) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Class IV O/W upstream; close proximity to catalogued habitat for steelhead.					
E) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5/6	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: close proximity to catalogued habitat for steelhead.					

Road #: 3000328

Map #: Craig D-3 NE

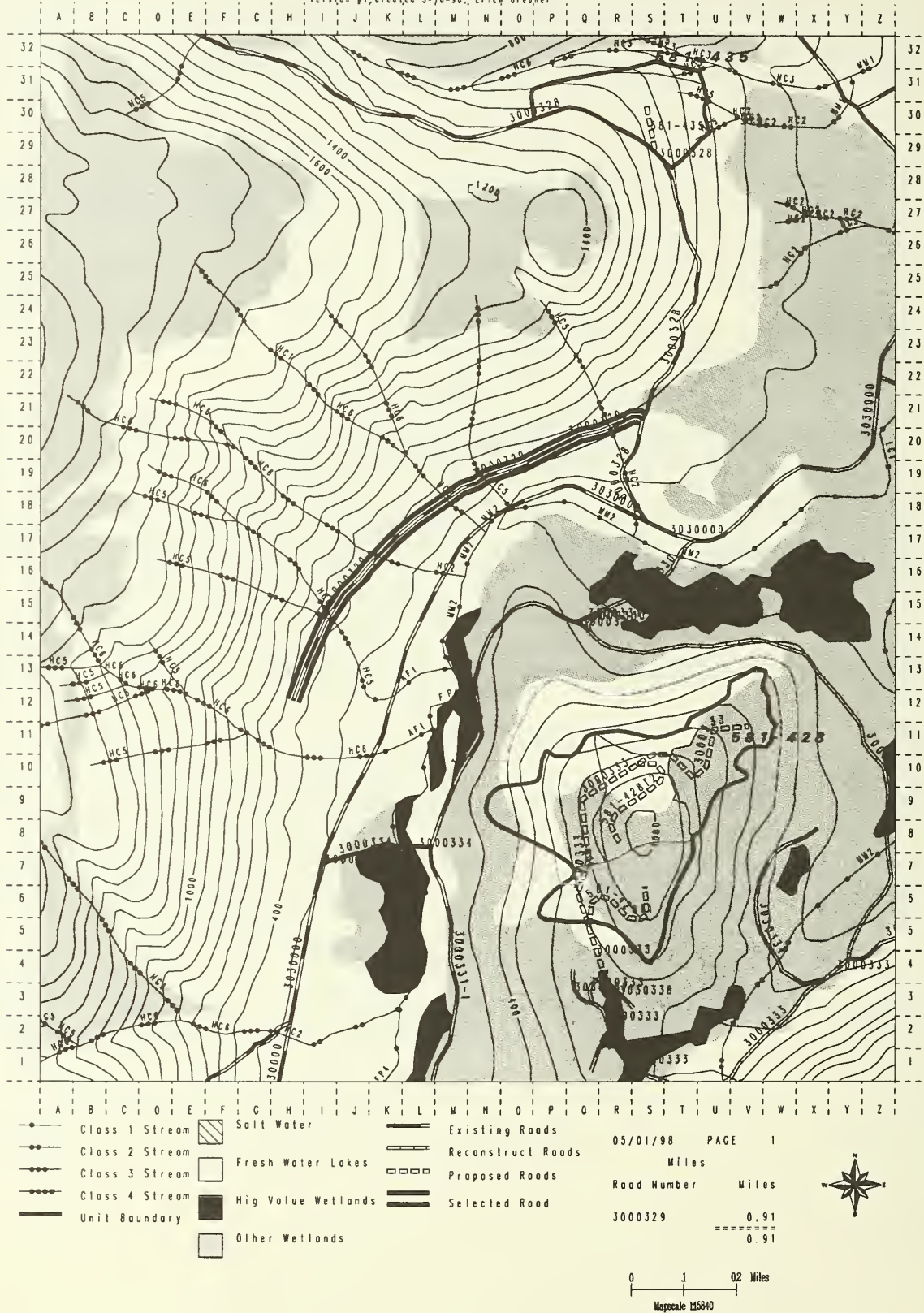
Aerial Photo: Yr. 91 Line 27N

Photo # s: 1090-102

NOTES

Luck Lake Project Area Draft Road Card 3000329

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3000329 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.91

N/A Construction (New or RE) Beginning M.P. 0.00 Length 0.91

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Prohibit:

Closure Devices:

Road is currently closed and placed in storage.

Tank trap at beginning of the road. Road washed out at approximately MP 0.4. Remainder of the road is overgrown with regenerated alder. Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Road may be used for future helicopter access. Retain current closed condition to reduce maintenance.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Road is currently closed with tank trap and alder covered. Washed out portion of road is stable and not a source for fine sediment. A road condition survey may identify culverts for removal on this road, however removal of any structures will require removal of alders. Removal of alders may mobilize more sediment than leaving the structures in place. BMP's 14.22 and 14.20.

Road Location Narrative:				
Existing road.				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
Three Class IV O/W crossings based on GIS interpretation. The stream crossings listed below are from the beginning to the end of the existing road.				
A) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:
Narrative: This water quality stream has a debris flow to the inlet of the culvert on the upstream side.				
B) MP: unknown	AHMU: Class IV O/W	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:
Narrative: Water quality stream.				
C) MP: unknown	AHMU: Class IV O/W	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage : no	Timing dates: none	Substrate:
Narrative: Water quality stream.				

Road #: 3000329

Map #: Craig D-3 NE

Aerial Photo: Yr. 91 Line 26N

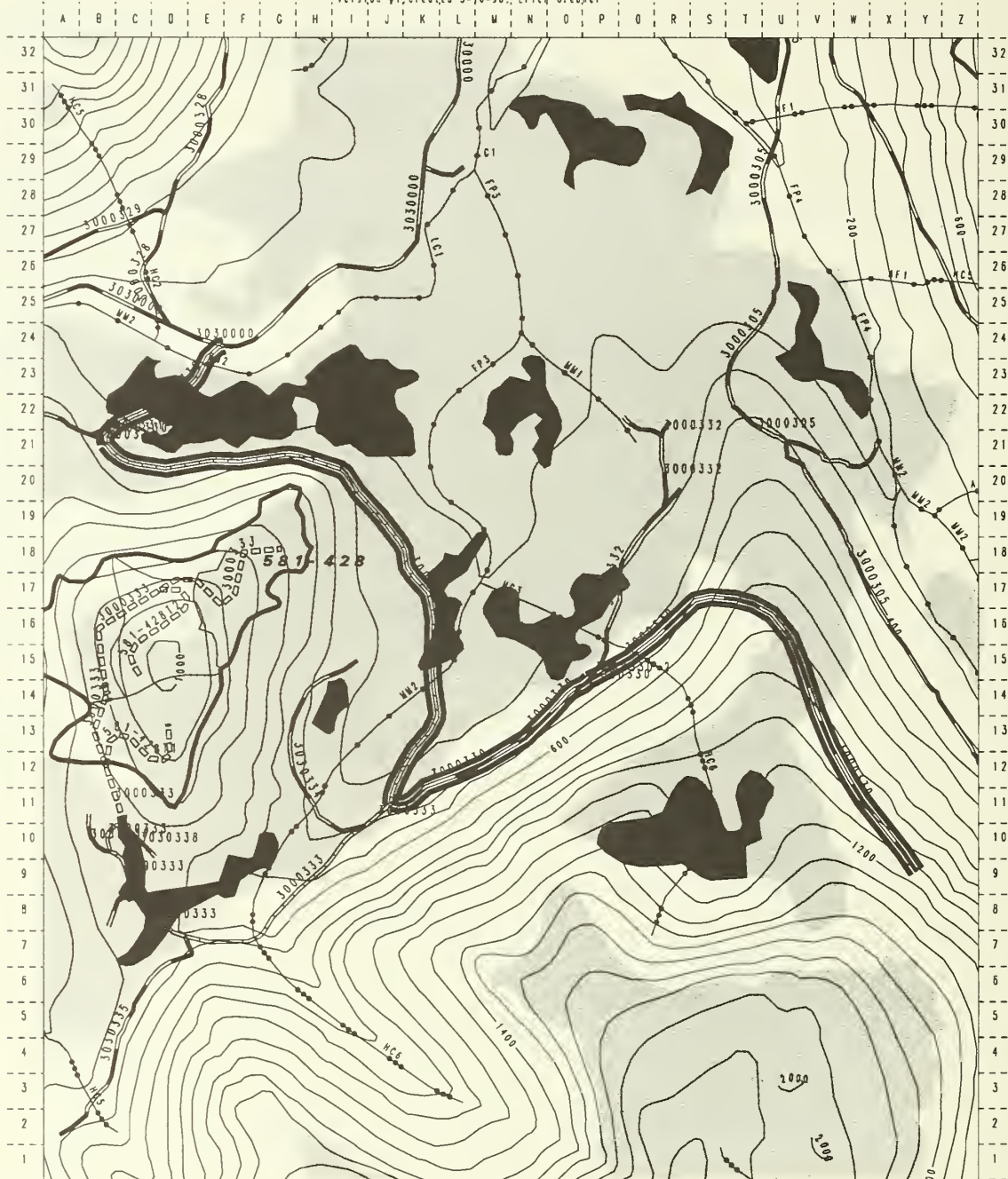
Photo #'s: 1090-210

NOTES

Luck Lake Project Area Draft Road Card 3000330

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

05/01/98 PAGE 1

Miles

Road Number Miles

3000330 2.68

2.68

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3000330</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>2.26</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>2.26</u>
------------------------------	----------------------------	--------------------

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
-----------------------	--------------------------------	---------------------------	------------------------

Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
--------------------------	------------------------	----------------------	--------------------

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull bridge and pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place a shot rock barrier across road just before the bridge crossing.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap near beginning of road.

Travel Management Narrative: Close road and remove bridge and pipes to eliminate potential for plugging pipes and road wash outs. The bridge does not meet railing and guard rail requirements for general public use.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

Will require helicopter/other access for reforestation work in unit 581-428. No other concerns.

Wildlife:

No blasting from March 1st to July 31st (raptor nest). No other concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

The 3000330 road needs minor reconstruction. Road drainage is inhibited by beaver dams at the culvert crossing (BMP's 14.9, 14.14 and 14.20) Timing may be required for reconstruction activities (BMP 14.6) see fisheries section. Reconstruct only portions of the road necessary to access unit 581-428. Close remainder of road by pulling drainage structures prone to plugging (BMP 14.24) and waterbarring the rest. The 3000330 road is scheduled for closure after harvest via waterbarring each drainage structure and removal of the bridge (BMP 14.22).

Road Location Narrative:

Existing Road accesses unit 581-435.					
Wetlands Avoidance:					
Rock Pits:					
Stream Crossings:					
Two Class I, One Class II, One Class IV O/W crossings are known based on GIS for the reconstruction. The crossings listed below are from the beginning to the end of the existing road.					
A) MP: unknown	AHMU: Class I	Channel Type: MM2	BF width	BF depth	
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: This is mainstem Luck Creek, SW Fork, ADF&G # 106-10-10300-0010-2070.					
B) MP: unknown	AHMU: Class I	Channel Type: MM2	BF width	BF depth	
Gradient %	Structure	Passage: yes	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: This crossing is Class I, MM2 channel type with coho catalogued immediately downstream.					
C) MP: unknown	AHMU: Class II	Channel Type: HC3	BF width	BF Depth	
Gradient %	Structure	Passage: yes	Timing dates: none	Substrate:	
Narrative: Northfork of 3000330 road.					
D) MP: unknown	AHMU: Class IV O/W	Channel Type: HC6	BF width	BF Depth	
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:	
Narrative: Mainstem 3000330 road					

Road #: 3000330

Map #: Craig D-3 NE

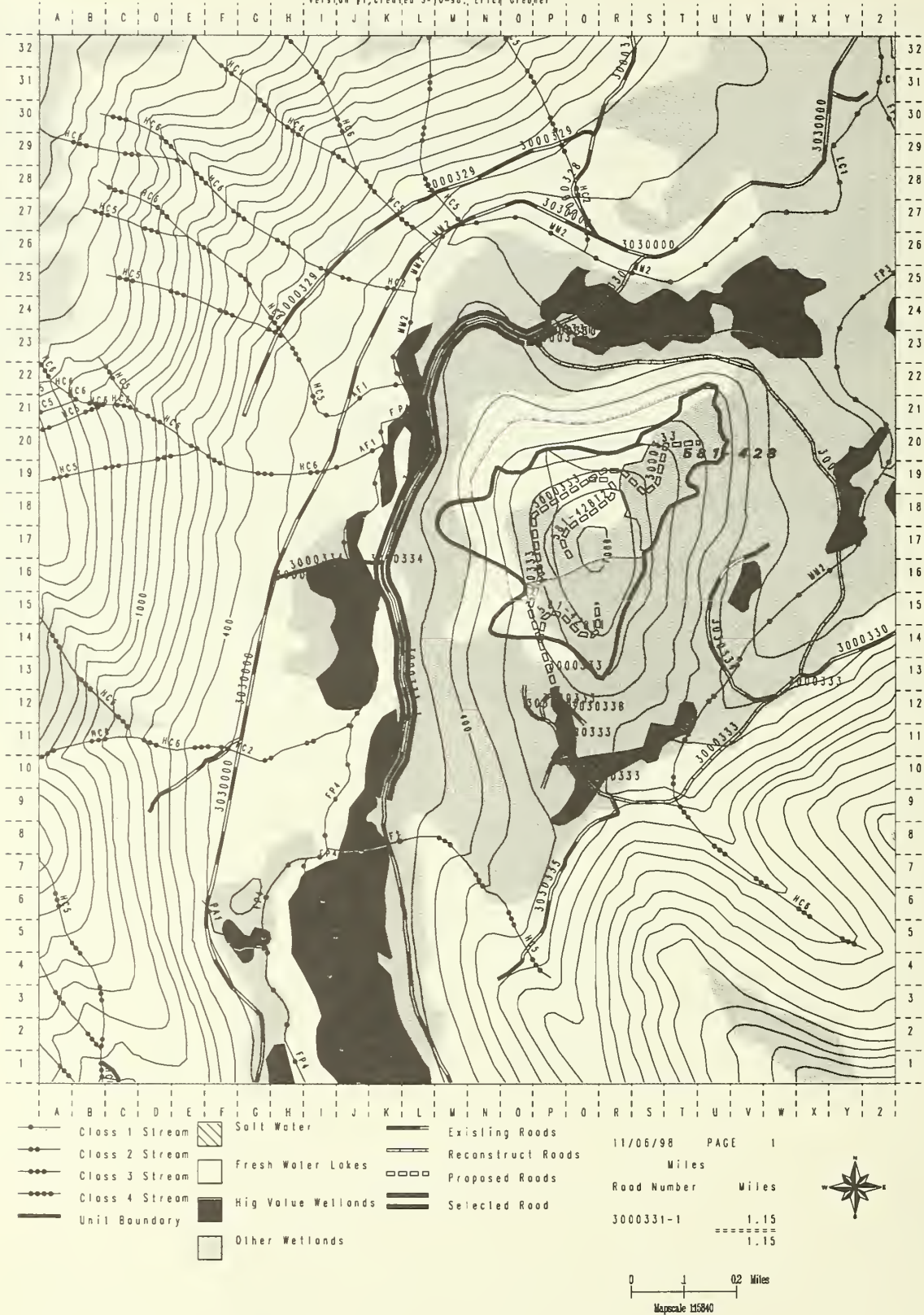
Aerial Photo: Yr. 1991 Line 27N

Photo #'s: 1090-108

NOTES

Luck Lake Project Area Draft Road Card 3000331-1

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3000331-1 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 1.15

N/A Construction (New or RE) Beginning M.P. 0.00 Length 1.15

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1

Intended Purpose and Use:

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Prohibit:

Place road in storage.

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road. Remove drainage structures .

Travel Management Narrative: Currently the road is drivable, however alder growth is dense and will close the road in the near future.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is alder covered but drivable. Drainage structures prone to plugging should be removed or ditched. All structures left in place should be waterbarred (BMP 14.9). Maintain existing alder cover to the extent practicable (BMP 14.8). Discourage vehicular access (BMP 14.22).

Road Location Narrative:
Existing Road
Wetland Avoidance:
Existing Road.
Rock Pits:
Stream Crossings: No stream crossings based on GIS.

Road #: 3000331-1

Map #: Craig D-3 NE

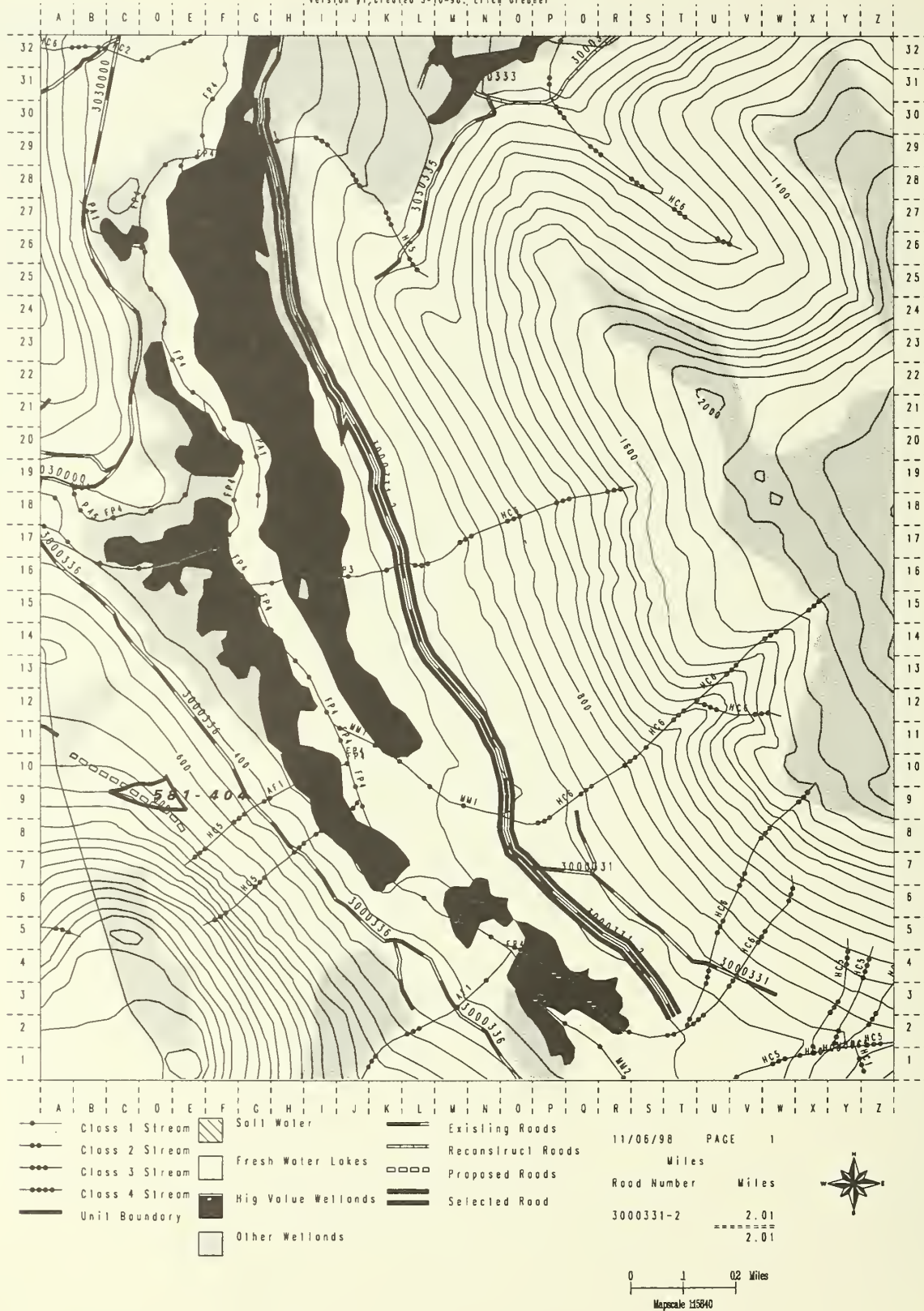
Aerial Photo: Yr. 91 Line 27N

Photo # s: 1090-108

NOTES

Luck Lake Project Area Draft Road Cord 3000331-2

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Greber



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3000331-2 Beginning Terminus M.P. 1.15 Ending Terminus M.P. 3.16

N/A Construction (New or RE) Beginning M.P. 1.15 Length 3.16

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT
Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1

Intended Purpose and Use:

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Place road in storage.

Prohibit:

Closure Devices:

Pulled bridge and organic closure.

Travel Management Narrative: Currently, the road is over grown by alders.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is alder covered but drivable. Drainage structures prone to plugging should be removed or ditched. All structures left in place should be waterbarred (BMP 14.9). Maintain existing alder cover to the extent practicable (BMP 14. 8). Reestablish resident fish passage if blocked by road (BMP 12.5 and 404 guidelines). Timing may be necessary for culvert removal, see fisheries section (BMP 14.6). Discourage vehicular access (BMP 14.22).

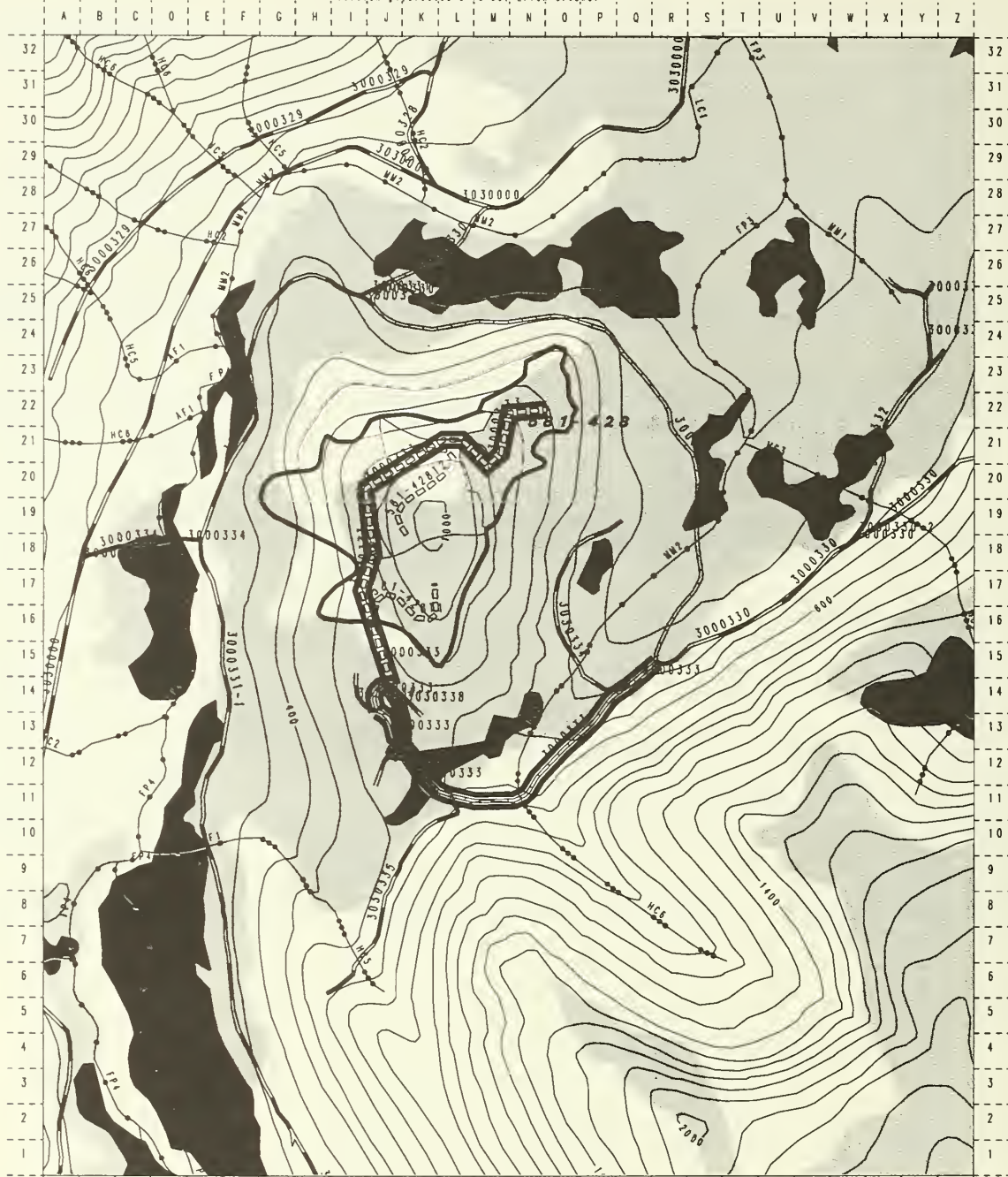
Road Location Narrative:					
Existing Road					
Wetland Avoidance:					
Existing Road.					
Rock Pits:					
Stream Crossings:					
Three Class I, Two O/W Class IV crossings based on GIS. The stream crossings listed below are from the end of the 3000331-1 to the end of the existing road.					
A) MP: unknown	AHMu: Class I	Channel Type: AF1	BF width	BF depth	
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Close proximity to steelhead.					
B) MP: unknown	AHMu: Class I	Channel Type: FP3	BF width	BF depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Water quality stream upstream, HC6; close proximity to steelhead.					
C) MP: unknown	AHMu: Class I	Channel Type: MM1	BF width	BF depth	
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:	
Narrative: Water quality stream upstream, HC6; close proximity to steelhead.					
D) MP: unknown	AHMu: Class IV O/W	Channel Type: HC6	BF width	BF depth	
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:	
Narrative: Water quality stream.					
E) MP: unknown	AHMu: Class IV O/W	Channel Type: HC6	BF width	BF depth	
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:	
Narrative: Water quality stream.					

Road #:3000331-2 Map #: Craig D-3NE Aerial Photo: Yr 91 Line: 27N Photo #'s: 1090-109,110

NOTES

Luck Lake Project Area Draft Road Card 3000333

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

05/01/98 PAGE 1
Miles
Road Number Miles
3000333 1.52
===== 1.52



0 1 0.2 Miles
Mapscale 1:15840

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD			
Road No. <u>3000333</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.29</u>	
<u>RE</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.74</u>	
<u>New</u> Construction (New or RE)	Beginning M.P. <u>0.74</u>	Length <u>0.78</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		Inactive	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:		Pull pipes, create water bars, reseed slopes, and place in storage.	
Prohibit:			
Closure Devices:		Tributary to 3000330 which will be closed by pulling a bridge.	
Travel Management Narrative: Close road and remove pipes to eliminate potential for plugging pipes and road wash outs. Tributary bridge on the 3000330 does not meet railing and guard rail requirements for general public use.			
Design Narrative Information:			
Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.			
Timber/Logging Systems:			
The 3000333 road accesses timber sale unit 581-428.			
Wildlife:			
No concerns.			
Silviculture:			
Road will be effectively closed with closure of 3000330. Will require helicopter or other access for required reforestation work in unit 581-428.			
Visual/Recreation:			
Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology, and karst resource concerns.			

Soils/Water:

On reconstruction section keep any excavated material out of poor sedge fen adjacent to the road (BMP 12.5, 14.12, and 14.19). New construction crosses some 60 percent slopes but no slopes over 67 percent. Full bench road construction (BMP 14.7) and control of side cast material (BMP 14.12) may be necessary for 300 to 500 feet on the west side of unit 581-428. The proposed route will cross a poor sedge fen and scrub forest in the north end of unit 428. The wetland is unavoidable while meeting grade constraints and accessing the necessary landing at the north end of the unit. This wetland sits in a small saddle between two knobs and donates water to an intermittent stream flowing northwest out of the unit. Apply BMP 12.5 and 33 CFR BMP's 1, 5, 6, 7 and 14. The 3000333 will be closed to vehicular traffic and meets the requirements for the silvicultural exemption from the 404 permit process. The proposed rock source is an existing rock pit with low erosion potential, keep overburden out of nearby wetlands (BMP 12.5).

Road Location Narrative:

Existing Road and new extension accesses Unit 581-428.

Wetlands Avoidance:

The new extension traverses forested wetlands that are unavoidable.

Rock Pits:**Stream Crossings:**

No known stream crossings on new construction. One Class II crossing is known for the reconstruction based on GIS. The information contained below is for the reconstructed section beginning to end of existing road.

A) MP: unknown	AHMU : Class II	Channel Type: HC3	BF width	BF depth	
Gradient %	Structure	Passage: yes	Timing dates: 6/15 to 9/1	Substrate:	

Narrative: This crossing is Class II downstream and Class III upstream.

Road #:3000333

Map #: Craig D-3 NE

Aerial Photo:

Yr. 1991

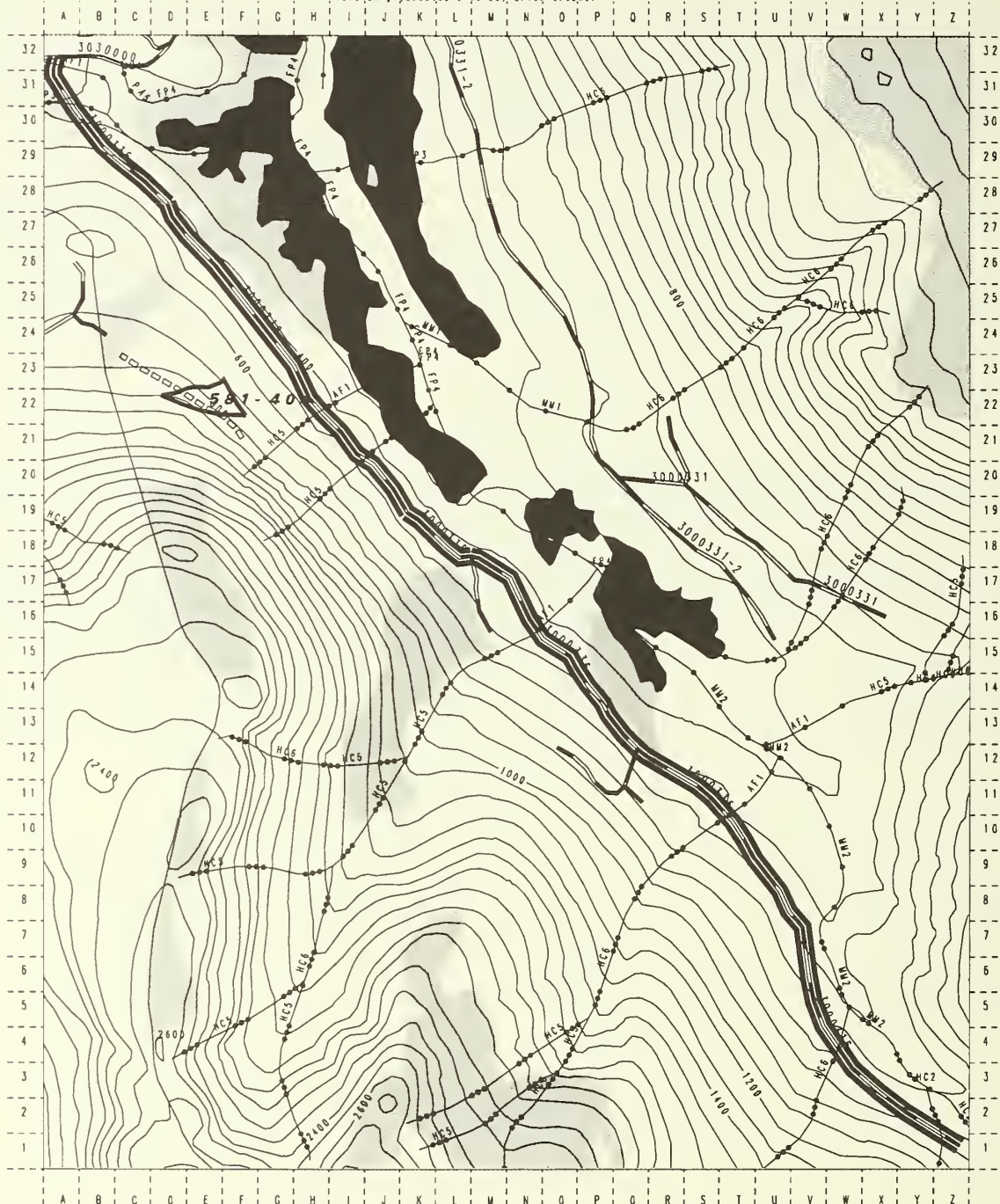
Line: 27N

Photo #'s: 1090-108

NOTES

Luck Lake Project Area Draft Road Card 3000336

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-98, Erich Grebner



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

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Miles

Road Number Miles

3000336

2.58

2.58

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3000336</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>2.58</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>2.58</u>
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
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Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>N/A</u>	Post Sale <u>1</u>
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Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Prohibit:

Closure Devices:

Close the road at the beginning of the road. Place road in storage.

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Road is closed by heavy alder growth.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is alder covered but marginally drivable. Drainage structures prone to plugging should be removed or ditched. All structures left in place should be waterbarred (BMP 14.9). Maintain existing alder cover to the extent practicable (BMP 14.8). Reestablish fish passage if blocked by road (BMP 12.5 and 404f guidelines). Timing may be necessary for culvert removal, see fisheries section (BMP 14.6). Restrict vehicular access (BMP 14.22).

Road Location Narrative:				
Existing Road .				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
Three Class I, One Class III, Three Class IV O/W stream crossings based on GIS interpretation. The stream crossings listed below are from beginning to end of existing road.				
A) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: This stream is in close proximity to catalogued steelhead and coho habitat.				
B) MP: unknown	AHMU: Class I	Channel Type: FP3	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: ADF&G # 106-10-10300-0010-2070-3030, tributary to SW Fork Luck Creek.				
C) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth
Gradient %		Passage: no	Timing dates: 7/15 to 8/15	Substrate:
Narrative: This stream is in close proximity to catalogued steelhead and coho habitat.				
D) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: Class III upstream; close proximity to catalogued steelhead and coho habitat.				
E) MP: unknown	AHMU: Class III	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:
Narrative: Class III upstream; near catalogued steelhead and coho habitat.				
F) MP: unknown	AHMU: Class IV O/W	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: 7/15 to 8/15	Substrate:
Narrative: This stream is near catalogued steelhead and coho habitat.				
G) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:
Narrative: This is a water quality stream.				

Road #:3000336

Map #: Craig D-3 NE &SE

Aerial Photo: Yr 91

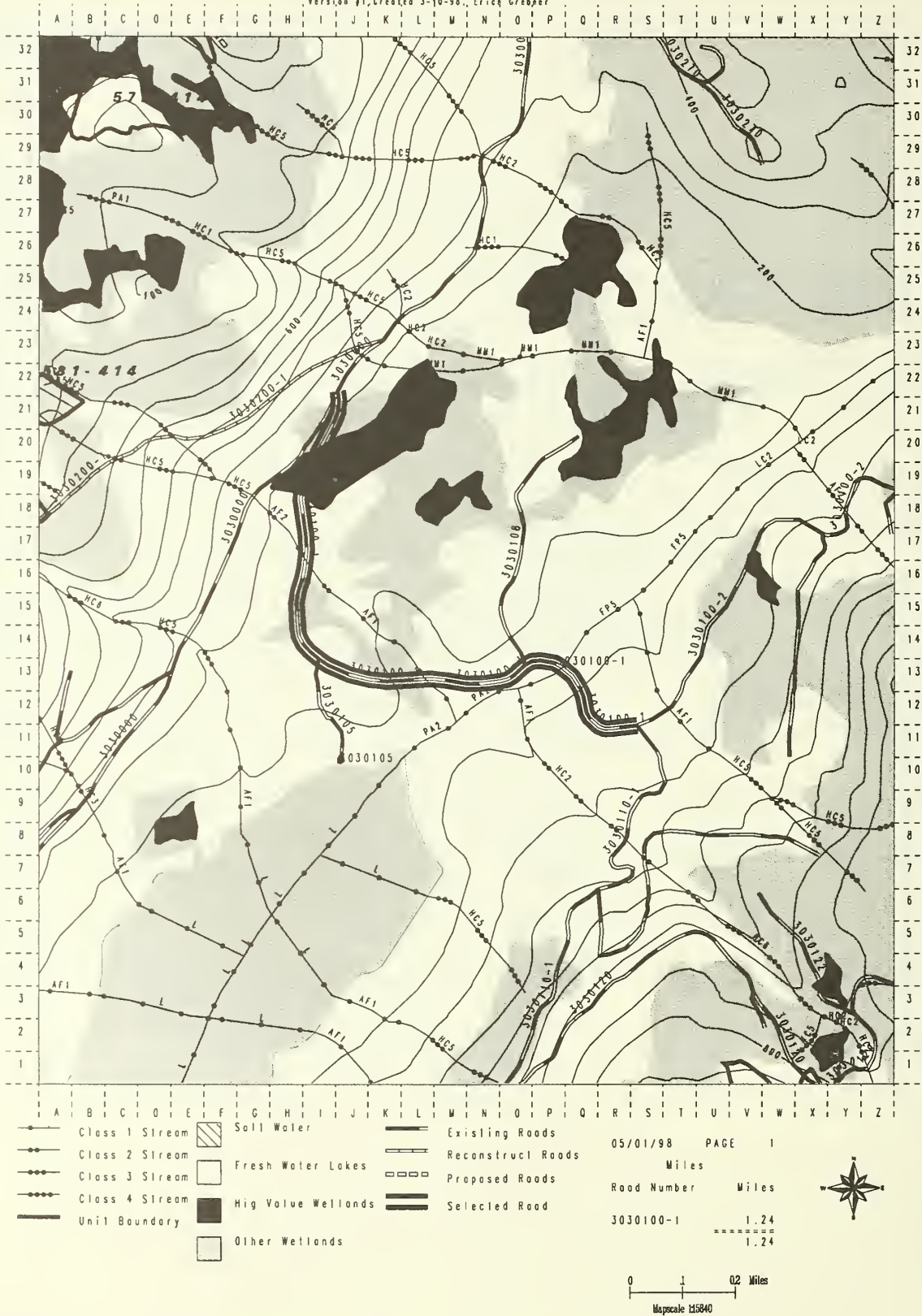
Line: 27

Photo #: 1090-109,110

NOTES

Luck Lake Project Area Draft Road Card 3030100-1

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030100-1</u>	Beginning Terminus M.P. <u>0.0</u>	Ending Terminus M.P. <u>1.24</u>	
N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>1.24</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level:	Active Sale <u>2</u>	Post Sale <u>2/1</u>

Intended Purpose and Use:

AFRPR Post Sale Status:	Active MP 0.00 to 1.03. Inactive MP 1.03 to 1.24
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Management Strategy:

Encourage:	
Accept:	MP 1.00 to 1.03
Discourage:	
Eliminate:	MP 1.03 to 1.24
Prohibit:	
Closure Devices:	Gate immediately before Eagle Creek bridge

Travel Management Narrative: Bridge is for industrial use only as it does not have safety guard rails and pedestrian rails. These would need to be installed to accommodate public traffic. Bridge is a Hamilton portable bridge not easily retrofitted for public traffic.

Design Narrative Information:

Existing road.

Timber/Logging Systems:

No concerns.

Silviculture:

Moderate potential for future windthrow salvage and minor future treatment needs for precommercial thinning. Essential reforestation treatments will be accomplished with helicopter access to units in VCU 582, and units 581-420, 423, 444, 445, 446, 447, 448, and 449.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Reconstruction is necessary to reestablish road drainage east of the Eagle Creek Bridge (BMP 14.9). Ditch cleaning should avoid placement of excavated material in wetlands or riparian areas (BMP 14.12, 12.6 and 12.5). Road is planned for closure following harvest, (BMP 14.22). Waterbar all drainage structures (BMP 14.5).

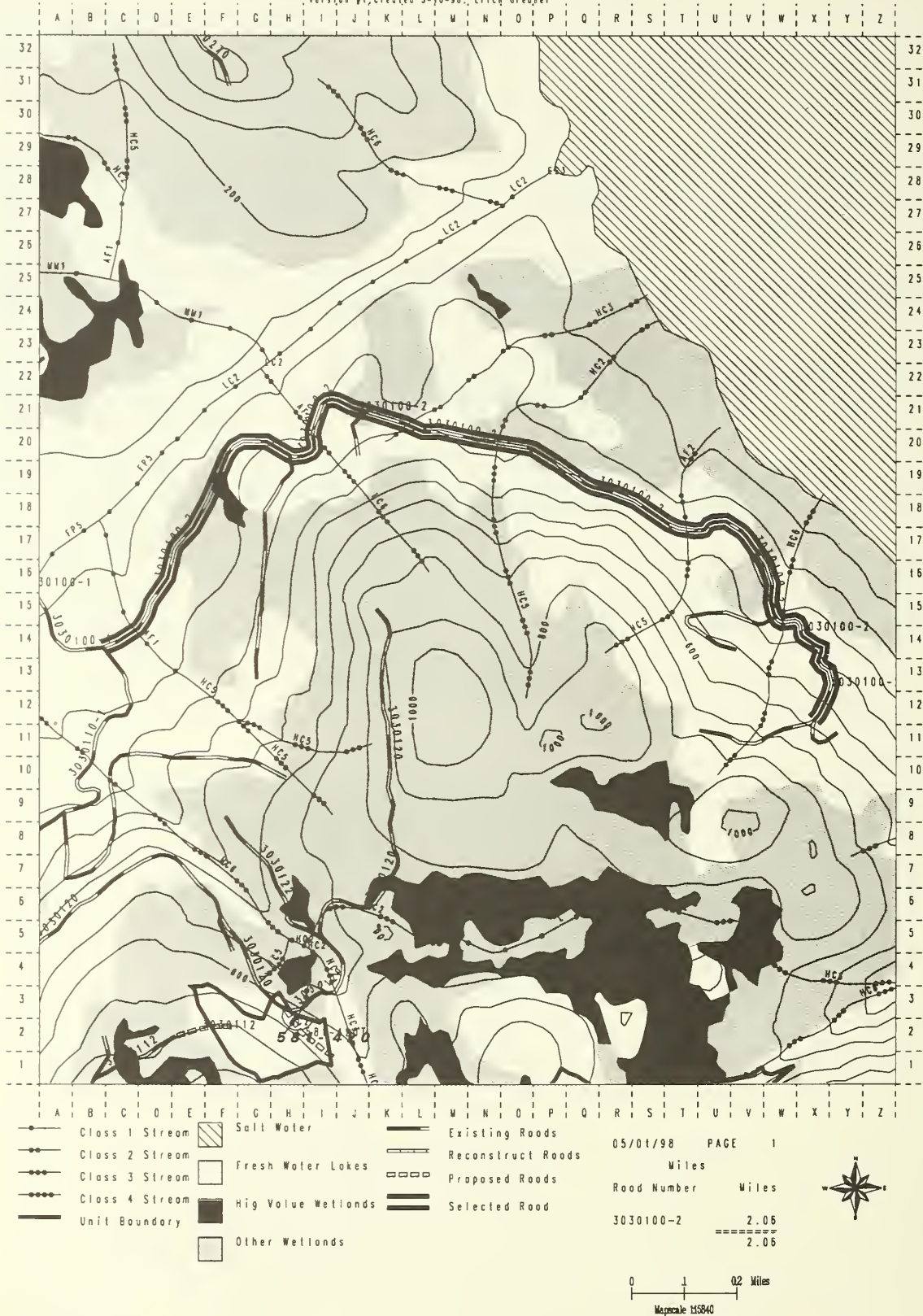
Road Location Narrative:				
Existing road.				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
Two Class I and one Class II stream crossings based on GIS interpretation. The stream crossings are listed from beginning to end of existing road segment.				
A) MP: unknown	AHMU: Class II	Channel Type: AF2	BF width	BF epth
Gradient %	Structure	Passage: yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to Class I coho habitat. Upstream of second crossing listed below.				
B) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Class I coho habitat.				
C) MP: 1.03	AHMU: Class I	Channel Type: FP5	BF width	BF depth
Gradient %	Structure: 450mm cmp	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: ADF&G # 106-10-10300, Eagle Creek.				

Road #: **3030100-1** Map #: Craig D-3 NE Aerial Photo: Yr 91 Line: 27N Photo #'s: 1090-103, 105

NOTES

Luck Lake Project Area Draft Road Card 3030100-2

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030100-2 Beginning Terminus M.P. 1.24 Ending Terminus M.P. 3.30

NEW Construction (New or RE) Beginning M.P. 1.24 Length 2.06

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1

Intended Purpose and Use:

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate: Storage

Prohibit:

Closure Devices:

Tank trap near junction of the 3030110 road. Remove approximately 100 linear feet of road bed adjacent to the tank trap. Remove malfunctioning drainage structures prior to closure.

Travel Management Narrative: This portion of the 3030100 road is heavily altered, however is drivable for approximately 1.75 miles.

Design Narrative Information:

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is alder covered but drivable. Drainage structures prone to plugging should be removed or ditched. All structures left in place should be waterbarred (BMP 14.9). Maintain existing alder cover to the extent practicable (BMP 14.8). Reestablish resident fish passage if blocked by road (BMP 12.5 and 404f guidelines). Timing may be necessary for culvert removal, see fisheries section (BMP 14.6). Restrict vehicular access (BMP 14.22).

Road Location Narrative:				
Existing road.				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
One Class I, three Class II, and two Class III stream crossings based on GIS interpretation. The stream crossings are listed from beginning to end of existing road segment.				
A) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: Close proximity to catalogued coho, steelhead, sockeye, pink, chum, stream				
B) MP: unknown	AHMU: Class II	Channel Type: AF2	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: 7/15 to 8/15	Substrate:
Narrative: Close proximity to catalogued coho, steelhead, sockeye, pink, chum, stream.				
C) MP: unknown	AHMU: Class II	Channel Type: HC3	BF width	BF depth
Gradient %	Structure	Passage: yes	Timing dates: none	Substrate:
Narrative: Flows into ocean.				
D) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF depth
Gradient %	Structure	Passage: Yes	Timing dates: none	Substrate:
Narrative: Flows into ocean.				
E) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:
Narrative: Class II stream which flows into ocean downstream of crossing.				
F) MP: unknown	AHMU: Class III	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: no	Timing dates: none	Substrate:
Narrative: Flows into ocean.				

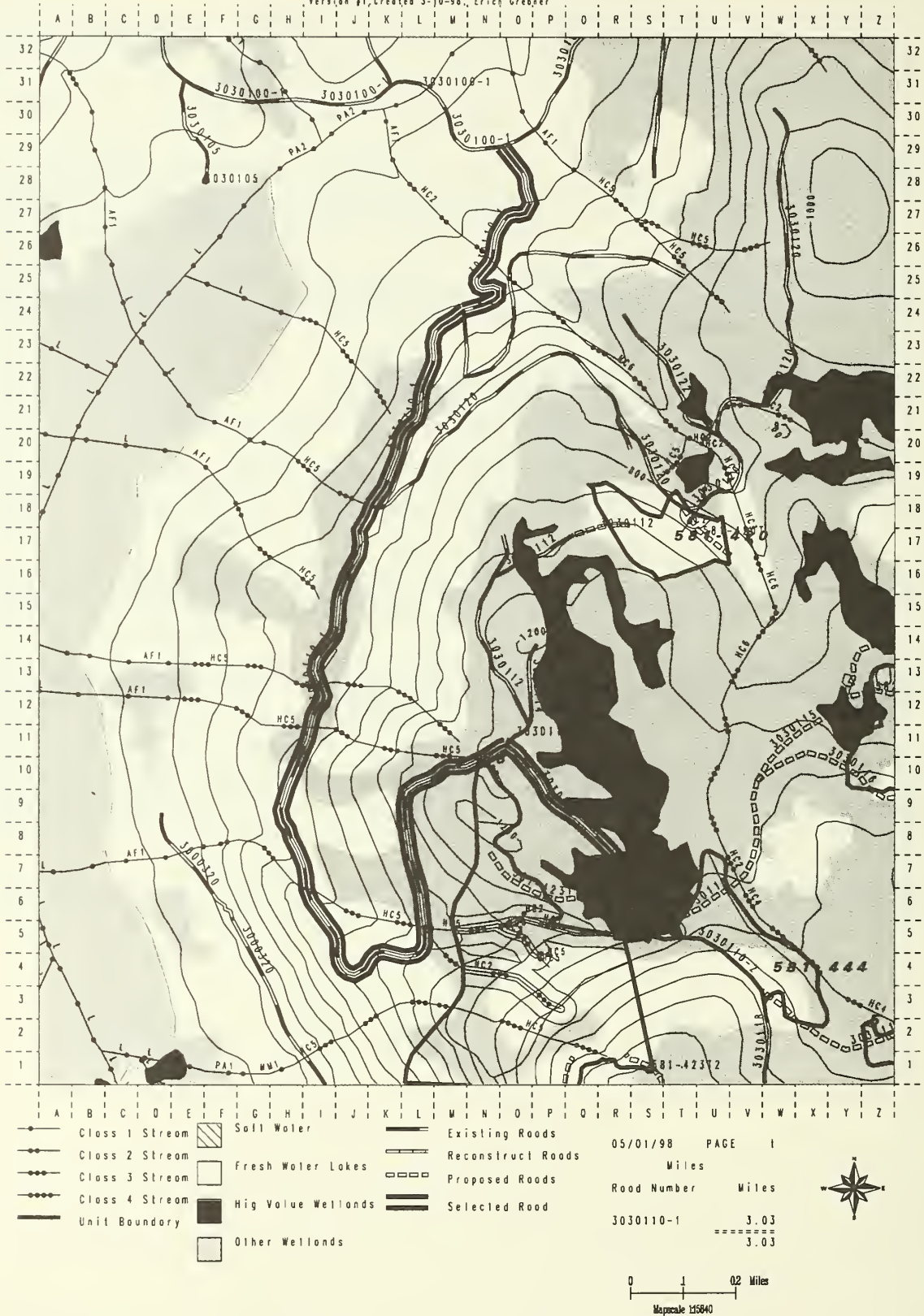
Road #:3030100-2 Map #: Craig D-3 NE Aerial Photo: Yr. 1991 Line: 27N Photo #'s: 1090-103

NOTES

Luck Lake Project Area Draft Road Card 3030110-1

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030110-1 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 3.03

N/A Construction (New or RE) Beginning M.P. 0.00 Length 3.03

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate: Storage

Prohibit:

Closure Devices: Remove all drainage structures and construct numerous waterbars on steep grades.

Travel Management Narrative: Installing a gate immediately before the Eagle Creek bridge on the 3030100 road for safety, resource and economic reasons. Remove pipes to eliminate potential for plugging pipes and road wash outs.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

The 3030110 road accesses timber sale units 581-445 , 581-446, 582-405 and 582-406.

Silviculture:

Access will be limited to helicopter. Reforestation work required in units 581-420, 423, 444, 445, 446, 447, 448, 449, and all units in VCU 582 will require helicopter access. Minor opportunity for further silvicultural treatment (precommercial tree thinning) in immediate future will be forfeited.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Existing road is open and drivable. Reconstruction is limited to ditchline cleanout and blading. Place any excavated material on stable upland sites if available (BMP 14.12, 12.5). Road to be closed to vehicular traffic (BMP 14.22). Waterbar all drainage structures (BMP 14.8).

Road Location Narrative:				
Existing Road accesses units 581-420 & 421, and 582-403 & 404.				
Wetlands Avoidance:				
Rock Pits:				
Stream Crossings:				
One Class II, four Class IV, and one Class IV O/W stream crossings are on this road segment based on GIS interpretation. The stream crossings are listed below from the beginning to the end of the existing road segment.				
A) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF depth
Gradient %	Structure	Passage: Yes	Timing dates: none	Substrate:
Narrative: Class I is approximately 800 feet downstream.				
B) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Class I is approximately 500 feet downstream.				
C) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Class I is approximately 500 feet downstream.				
D) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Class I is approximately 500 feet downstream.				
E) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Upstream of previous stream D crossing.				
F) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Upstream of previous stream C crossing.				

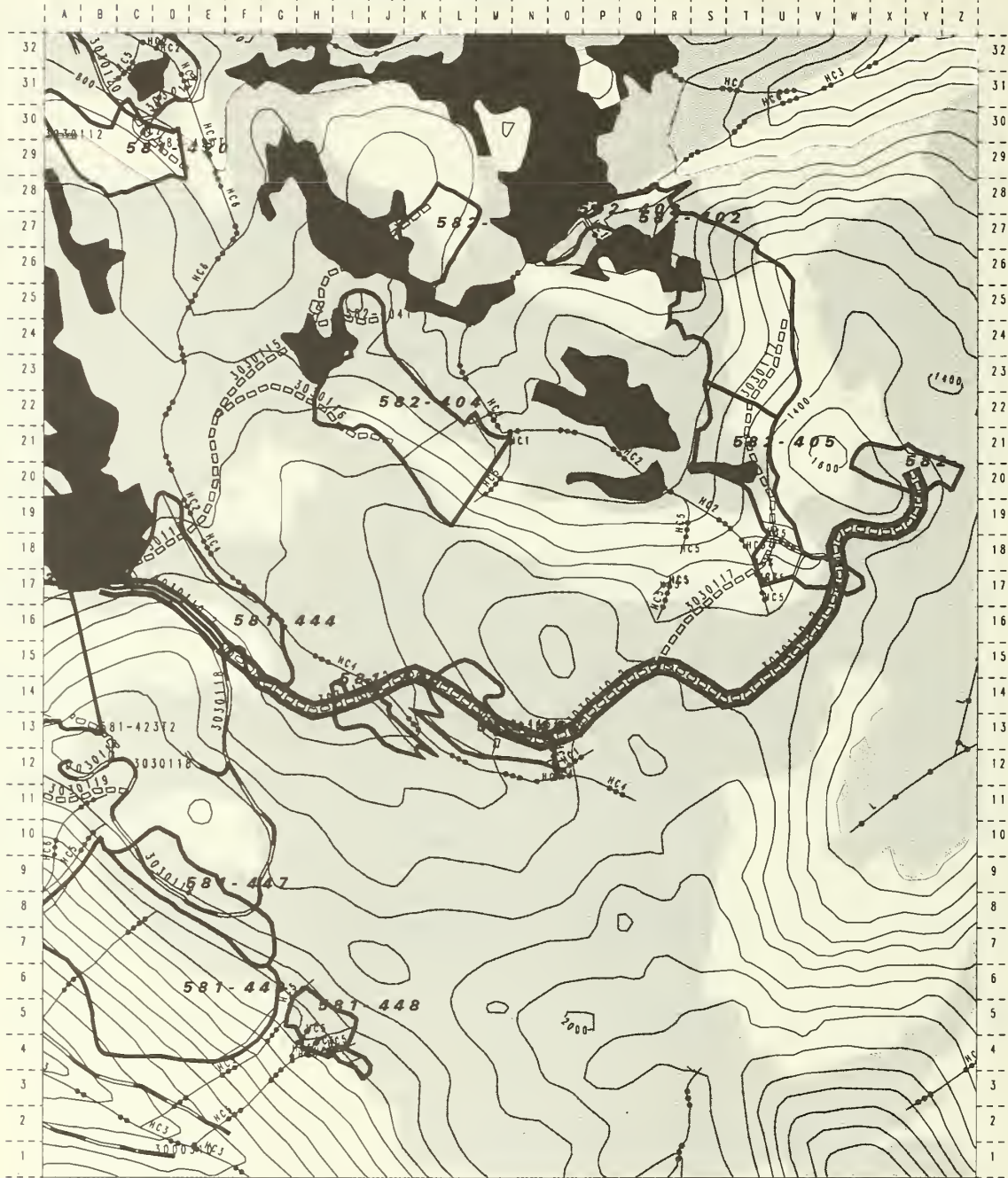
Road #:3030110-1 Map #: Craig D-3NE Aerial Photo: Yr 91 Line:27N Photo #'s: 1090-104, 105

NOTES

Luck Lake Project Area Draft Road Card 3030110-2

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

05/01/98 PAGE 1

Miles

Road Number Miles

3030110-2 1.88

1.88

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030110-2 Beginning Terminus M.P. 3.03 Ending Terminus M.P. 4.91

New Construction (New or RE) Beginning M.P. 3.28 Length 1.63

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource and economic concerns.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

No concerns.

Silviculture:

Road closure will limit access for cultural treatments. Required reforestation treatments will be accomplished with helicopter access to all units in VCU 582 and units 581-444, 445, 446, 447, 448, 449.

Wildlife:

Subsistence use area.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake or Clarence Strait. No sidecast. Locate rockpit in area unseen from Luck Lake or Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

Proposed route is located entirely in forested wetlands and subalpine meadow/scrub-shrub wetlands. The wetlands are unavoidable. See road location narrative. Apply BMP's 12.5, 14.18, 14.19, 14.9, and 33 CFR BMP's 1, 2, 4, 5, 6, 8, and 14. Sideslopes are less than 30 percent gradient. Units 581-446 and 582-406 are located in the forested wetland/subalpine scrub-shrub complex. Due to steep sideslopes and grade requirements a road accessing the harvest units can not avoid crossing wetlands. The wetlands are donor wetlands located on or near topographic summits. The wetlands serve to store and donate water to downstream resources. The proposed road route is located on a the summit between two watersheds where the flow is lowest. Due to the length of the road a rock source may need to be located in a wetland site (33 CFR BMP 7). The route represents the least environmental impact while accessing the timber resources (BMP 14.2 and 33 CFR BMP 1). 33 CFR BMP's 5 and 6 apply to the construction. The road is to be closed to vehicular traffic following harvest (BMP 14.22). Waterbar all drainage structures as part of closure (BMP 14.8). Road 3030110-2 meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 581-445, 446 and 582-405

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible. Moving the route southerly would create more difficult stream crossings in deep notches and require larger cuts within open bogs as side slopes are steeper than the proposed route.

Rock Pits:

Stream Crossings: One Class III stream crossing based on GIS interpretation and unit field review. The stream crossing listed below are from the beginning to the end of the road segment.

A) MP: unknown	AHMU: Class III	Channel Type: HC4	BF width	BF depth	
Gradient	Structure	Passage: no	Timing dates: none	Substrate:	

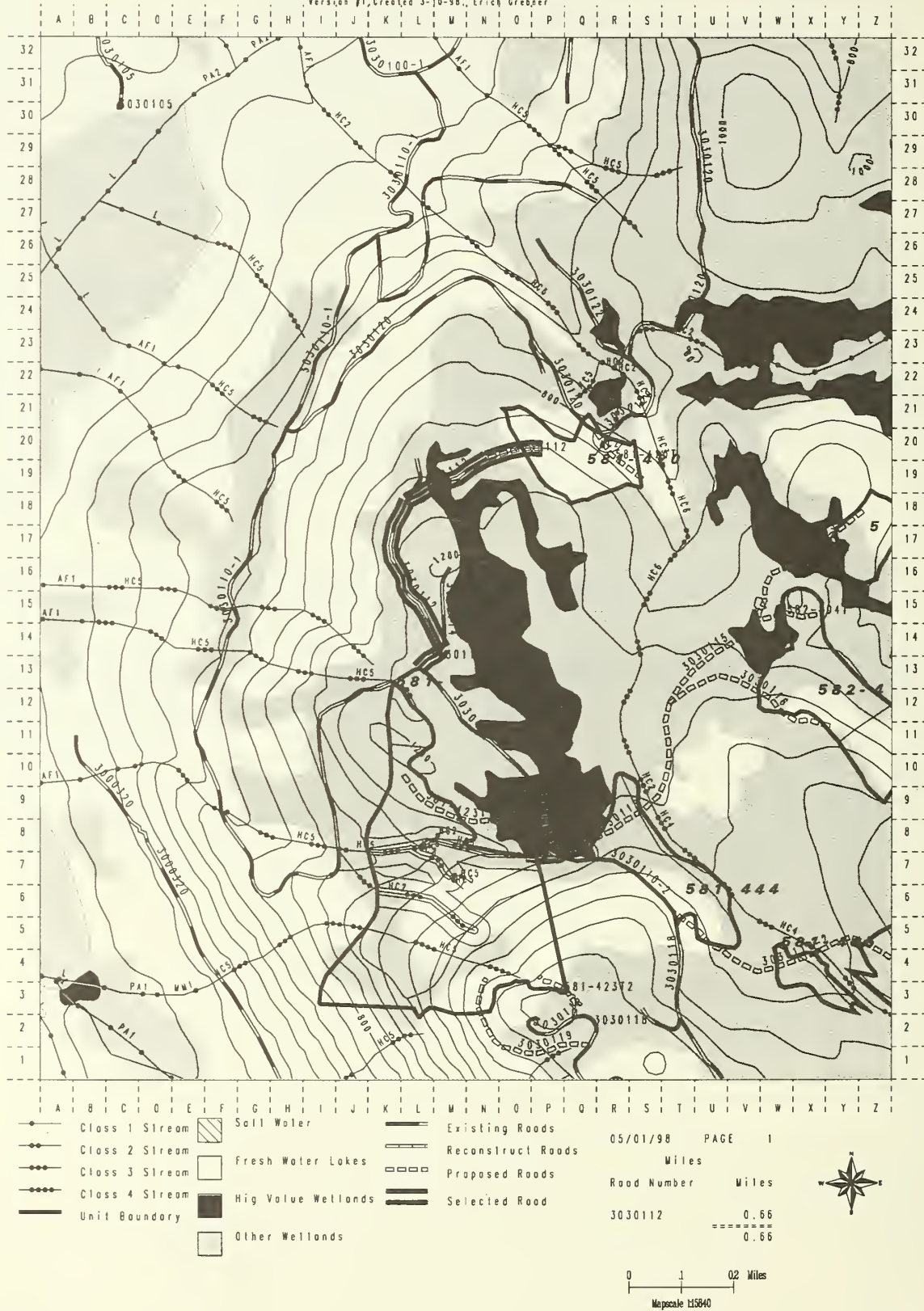
Narrative: Large bedload mover. This is stream 445-1 and also 446-1.

Road #:3030110-2 Map #: Craig D-3 NE Aerial Photo: Yr 79 Line: 12 36 Photo #:379-47, 48 & 49

NOTES

Luck Lake Project Area Draft Road Card 3030112

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030112	Beginning Terminus M.P. 0.00	Ending Terminus M.P. 0.66	
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New Construction (New or RE)	Beginning M.P. 0.55	Length 0.11
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Road Management Objectives:

Funct. Class L	Traffic Service Level D	Hwy. Safety Act NO	Design Veh.: LT
Critical Veh.: LB	Maint. Level: 1	Active Sale 2	Post Sale 1
Intended Purpose and Use: Silvicultural activities.			

AFRPR Post Sale Status:	Inactive
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Management Strategy:

Encourage:	
Accept:	
Discourage:	
Eliminate:	Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.
Prohibit:	
Closure Devices:	Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030112 road accesses timber sale unit 581-420.

Silviculture:

Minor opportunities for future cultural treatment. Access to unit 581-420 will be by helicopter for required reforestation work.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology, and karst resource concerns.

Soils/Water:

The existing 3030112 road is a low sediment risk road located on relatively flat topography. The road is open and drivable. Reconstruction consists of blading. New construction will cross the nose of a ridge through subalpine meadow and scrub-shrub forested wetlands to access unit 581-420. Unit 420 is a long sloping unit of 40 percent gradient. The existing 3030120 road accesses the very bottom corner of the proposed unit 420, but downhill yarding can not meet soil protection requirement for the unit. Unit 420 could be helicopter yarded but this option was not considered cost effective considering the resources at risk. The wetlands at risk sit on the nose of a ridge and serve to donate water to downslope resources. Apply 33 CFR BMP's 4, 5, 6, and 14. Road 3030112 will be closed to vehicular traffic following timber harvest and meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses the upper portion of Unit 581-420

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.

Rock Pits:**Stream Crossings:**

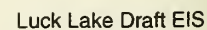
No known stream crossings on new construction. Reconstruction has two Class IV G/W crossing prior to reaching unit 581-420. Beyond unit 420 there are two Class III crossings. Stream crossing information is based field review. The stream crossings listed below are from the beginning to the end of the road segment.

A) MP: unknown	AHMU: Class IV G/W	Channel Type: HC5	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Water quality stream.					
B) MP: unknown	AHMU: Class IV G/W	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 420-2					
C) MP: unknown	AHMU: Class III	Channel Type: HC2	BF width	BF Depth	
Gradient %		Passage: No	Timing dates: none	Substrate:	
Narrative: Large bedload mover. This is stream 420-1					
D) MP: unknown	AHMU: Class III	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Flows into stream with crossing C					

Road #:3030112 Map #: Craig D-3 NE Aerial Photo: Yr 91 Line:28N Photo #'s: 1090-6, 7

NOTES

Mopscote t:15840 (4 inch to Mile)
Version #1, Created J-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030115</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.95</u>	
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New Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.95</u>	
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
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Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
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Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030115 road accesses timber sale units 581-444 and 582-403.

Silviculture:

Access to units 582-403 and 404 will be by helicopter for required reforestation work.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake and Clarence Strait. No sidecast. Locate rockpit in area unseen from Luck Lake, mainline (3030000), or Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known mineral concerns. Possible Karst resource concerns from MP 0.0 through harvest unit 581-444. Road alignment should avoid any karst features and should not alter any karst drainages. During road construction, surface runoff should not be directed or redirected in to collapse features and sink holes adjacent to the alignment. Cut banks should be seeded as soon as possible to minimize erosion. Quarry placement and development should be approved by both the Forest Geologist and District Fisheries Staff.

Soils/Water:

The 3030115 contours across subalpine scrub-shrub forested wetlands and meadows to access unit 582-403 on a small knob. Most of the high value wetlands shown on the wet-hab map are short sedge fens and do not meet the high value wetland criteria. The wetlands are unavoidable while providing access to units 403 and 404. The wetlands sit on a topographic summit and donate water to downstream resources. Impacts to water quality from crossing the wetlands should be negligible. Apply 33 CFR BMP's 5 and 6. A tall sedge fen does exist near milepost 0+00. The final road location will need to avoid the tall sedge fen as the wetland functions to transfer and filter hill slope water before it enters the water quality stream (BMP 12.5 and 33 CFR BMP 1). The 3030115 will be closed to vehicular traffic following harvest. (BMP 14.22). Analysis of Drainage structures for removal will be considered at the time of closure (BMP 14.24 and 14.8). With minor relocation the proposed road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 582-403 and 404.

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible. Moving the route southerly would create more difficult stream crossings in deep notches and require larger cuts within open bogs as side slopes are steeper than the proposed route.

Rock Pits:

Possible karst resource concerns. Quarry placement and development should be approved by both the Forest Geologist and District Fisheries Staff.

Stream Crossings:

One Class III stream based on field review. The stream crossing listed below is from the beginning to end of the road segment.

A)MP: unknown	AHMU: Class III	Channel Type: HC4	BF width	BF depth	
Gradient	Structure	Passage: No	Timing dates: none	Substrate:	

Narrative: Large bedload mover. This is stream 444-1

Road #: 3030115 Map #: Craig D-3 NE

Aerial Photo: Yr. 79

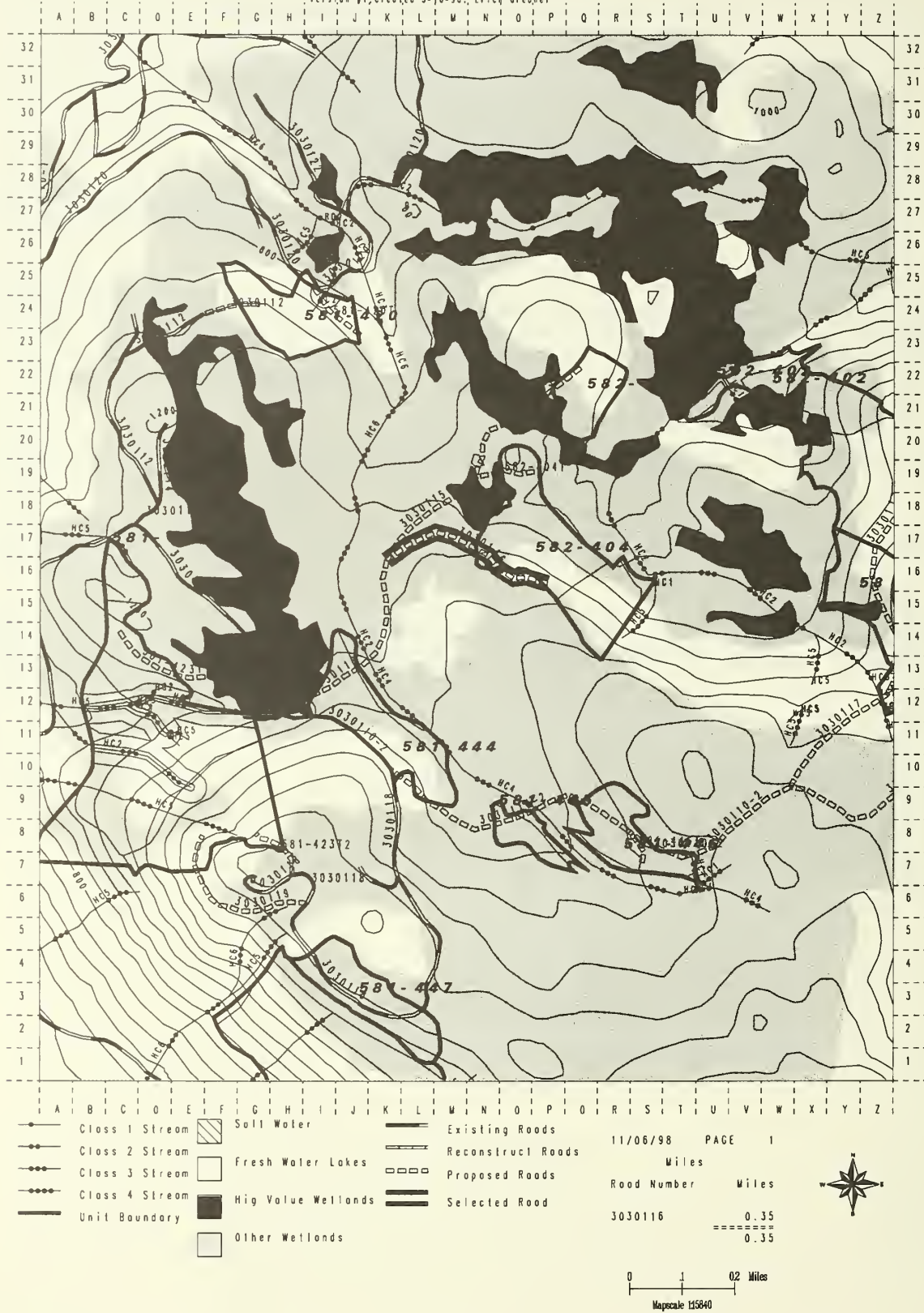
Line 12 36

Photo # s: 379-47, 48 & 49

NOTES

Luck Lake Project Area Draft Road Card 3030116

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD			
Road No. <u>3030116</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.35</u>	
<u>New</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.35</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		<u>Inactive</u>	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:	Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.		
Prohibit:			
Closure Devices:	Construct tank trap at beginning of road.		
Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.			
Design Narrative Information:			
Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J- hole turnouts.			
Timber/Logging Systems:			
The 3030116 road accesses timber sale unit 582-404.			
Silviculture:			
Minor potential for cultural and salvage work. Access to units 582-402 and 405 will be by helicopter for required reforestation work.			
Wildlife:			
Subsistence use area.			
Visual/Recreation:			
Minimize cuts and fills visible to Luck Lake and Clarence Strait. No sidecast. Locate rockpit in area unseen from Luck Lake, mainline (3030000), or Clarence Strait.			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			
Soils/Water:			
The 3030316 proposes to access unit 582-404 from the northwest across non-forested poor fens and cedar-hemlock forested wetlands. The wetlands along the route include two tenths of a mile on a poor fen and forested wetland complex. The wetlands are unavoidable while providing access to unit 404. The wetlands sit on a summit and donate water to downstream resources. Impacts to water quality from crossing the wetlands should be negligible. Apply BMP 12.5 and 33 CFR BMP's 1, 4, 5, 6, 8, & 14. The 3030116 will be closed to vehicular traffic following harvest (BMP 14.22). The 3030116 meets the requirements for the silvicultural road exemption from the 404 permit process.			

Road Location Narrative:
Road accesses Unit 582- 404.
Wetlands Avoidance:
The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.
Rock Pits:
Stream Crossings: There are no known stream crossings along this road. There are no known fisheries concerns.

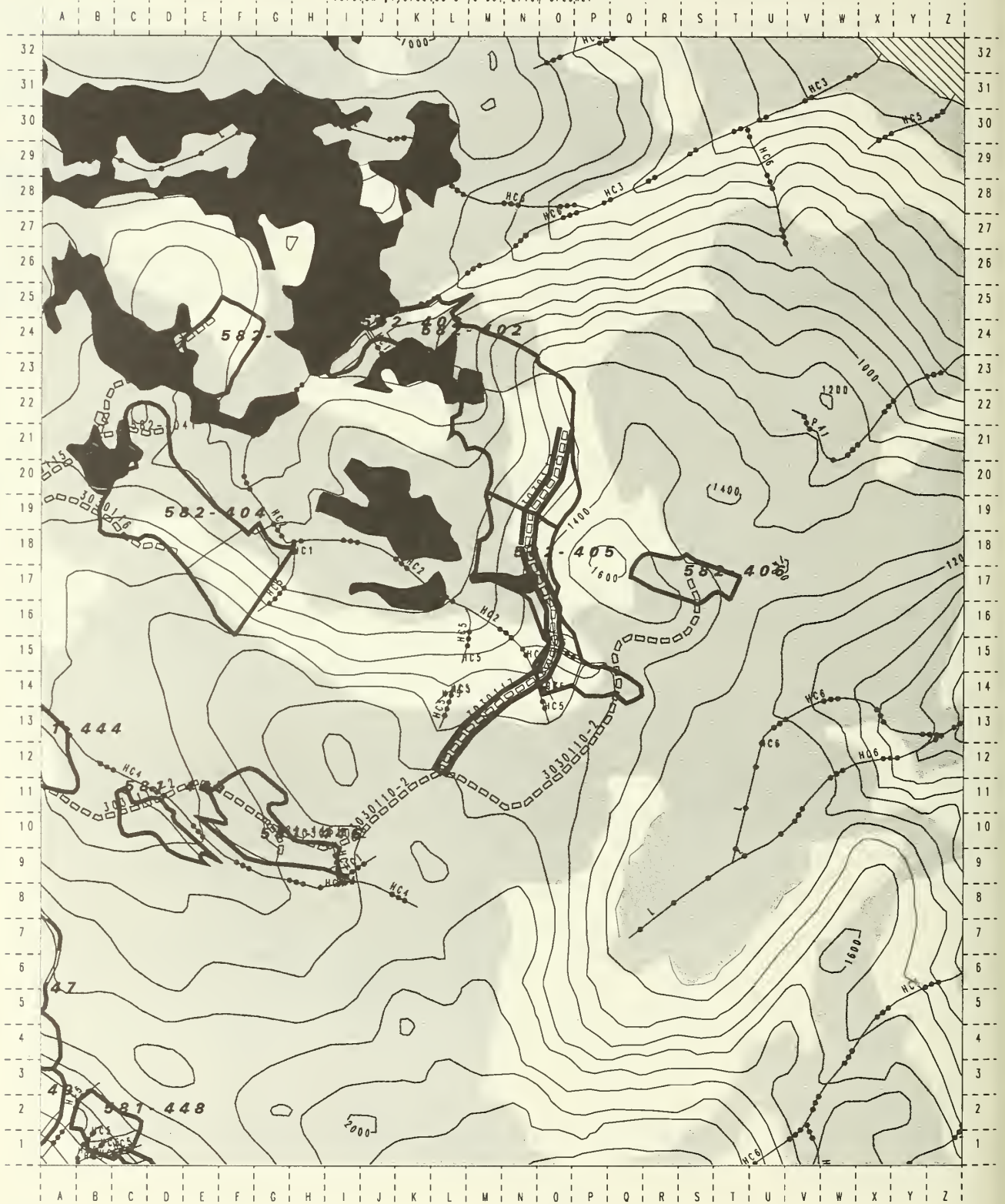
Road #: **3030116** Map #: Craig D-3 NE Aerial Photo: Yr. 79 Line 12 36 Photo #'s: 379-47, 48 & 49

NOTES

Luck Lake Project Area Draft Road Card 3030117

Mpscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

05/01/98 PAGE 1
Miles
Road Number Miles
3030117 0.72
===== 0.72



0 1 0.2 Miles

Luck Lake Draft EIS

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030117 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.72

New Construction (New or RE) Beginning M.P. 0.00 Length 0.72

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030117 road accesses timber sale unit 582-405 and unit 582-402.

Silviculture:

Modest potential for cultural treatments in the future. Access restrictions will require the use of helicopter for required reforestation work in units 582-402 and 405.

Wildlife:

Subsistence use area.

Visual/Recreation:

Minimize cuts and fills visible to Clarence Strait. No sidecast. Locate rockpit in area unseen from Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

Road crosses low to moderate vulnerability karst, consult area geologist prior to construction.

Soils/Water:

The 3030117 route drops down from the subalpine meadow/scrub-shrub wetland and across a small area of low to moderate vulnerability karst to access units 582-402 and 405 on a nice bench. Sideslopes range from 20 to 40 percent. Special care should be taken when constructing through the karst area and in crossing adjacent water quality streams. Excavated material may need to be end-hauled to stable locations away from karst resources and streams (BMP 14.12). Road drainage should be away from sinkholes (BMP 14.9). Road construction should not be left unfinished in this area for any length of time (BMP 14.10 and 14.11). The site should not be used for a rock source. The wetlands along the route include two tenths of a mile on alpine meadow/scrub-shrub complex. The wetlands are unavoidable while providing access to units 402 and 405. The wetlands sit on a summit and donate water to downstream resources. Impacts to water quality from crossing the wetlands should be negligible. Apply 33 CFR BMP's 5 and 6. The 3030117 will be closed to vehicular traffic following harvest. (BMP 14.22). Analysis of Drainage structures for removal will be considered at the time of closure (BMP 14.24 and 14.8). The proposed road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 582 -402 and 582-405. The route is the shortest to and within the harvest unit. Other routes are longer increasing road density and wetland impacts.

Wetlands Avoidance:

The route is the shortest possible route within open bogs and fens. The beginning of the route traverses some open bogs and fens on 25% to 35% side slopes. The remainder of the route is within forested wetlands.

Rock Pits:**Stream Crossings:**

Two Class IV G/W stream crossings based on field review. The stream crossings listed below are from beginning to end of the road segment.

A) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Class IV G/W upstream. This is stream 405-1				
B)MP: unknown	AHMU: ClassIV O/W	Channel Type: HC5	BF width	BF depth
Gradient %		Passage: No	Timing dates: none	Substrate:
Narrative: Flows into same stream as crossing B. This is stream 405-3.				

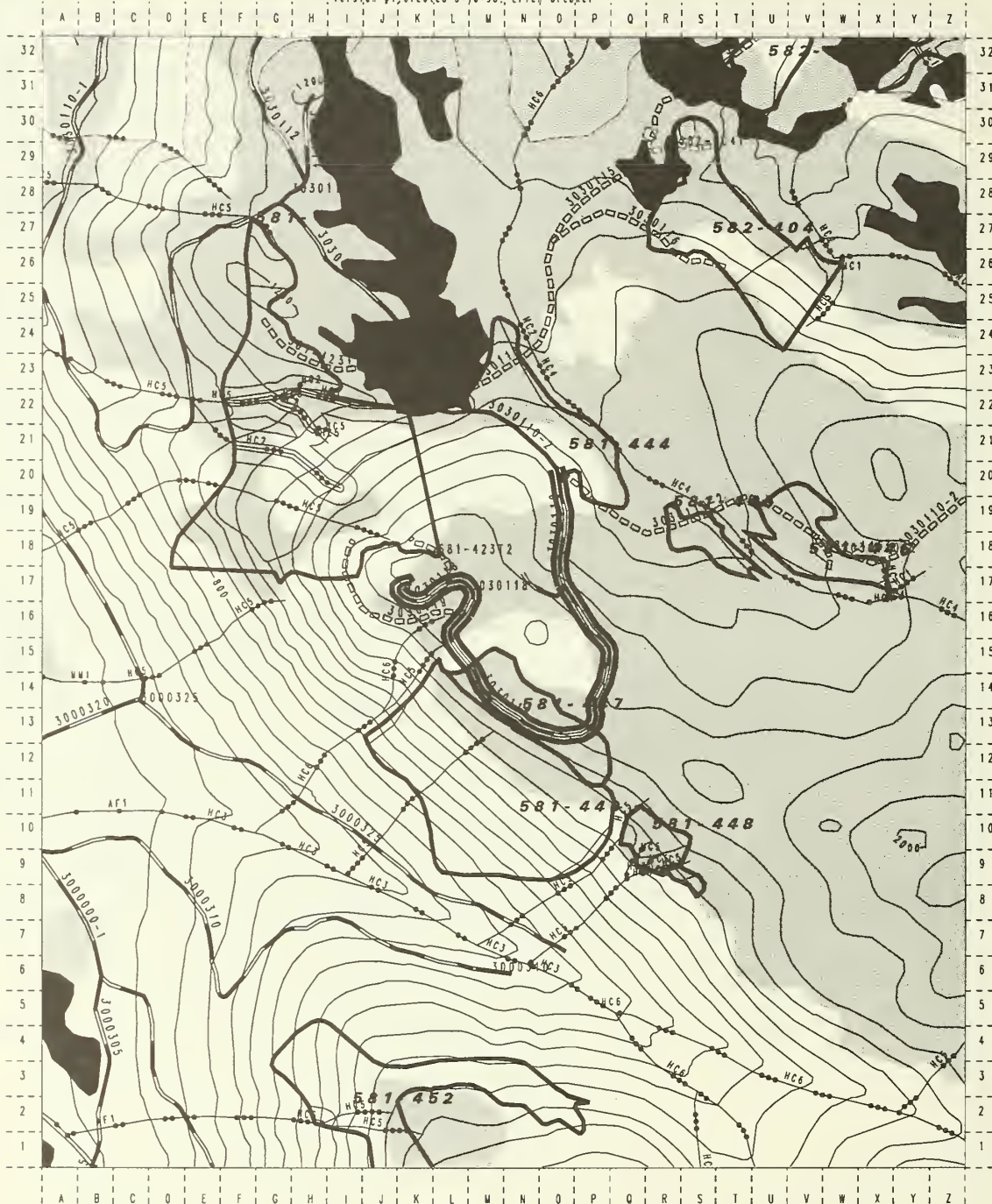
Road #: **3030117** Map #: Craig D-3 NE Aerial Photo: Yr. 79 Line 12 37 Photo #'s: 279-182, 183 & 184

NOTES

Luck Lake Project Area Draft Road Card 3030118

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-30-98, Erich Grebner



- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Class 4 Stream
- Unit Boundary
- Salt Water
- Fresh Water Lakes
- High Value Wetlands
- Other Wetlands

- Existing Roads
- Reconstruct Roads
- Proposed Roads
- Selected Road

05/01/98 PAGE 1

Miles

Road Number Miles

3030118 1.10
1.10

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030118</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.10</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>1.10</u>	
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
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Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
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Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road. Waterbar steep grades sufficiently to prevent road surface erosion.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

Some potential for future cultural treatments and salvage. Current access plans will limit access to helicopter. Required reforestation work in units 581-447, 448 will be completed with helicopter access.

Wildlife:

Subsistence use area.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. No reconstruction necessary. Road to be closed to vehicular traffic (BMP 14.22). Waterbar all drainage structures (BMP 14.8).

Road Location Narrative:
Existing Road accesses units 581-423, 447 and 448.
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings: No known stream crossings. No known fisheries concerns.

Road #: **3030118** Map #: Craig D-3 NE

Aerial Photo: Yr. 79

Line 12 36

Photo #'s: 379-47 & 49

Aerial Photo: Yr. 91

Line 28N

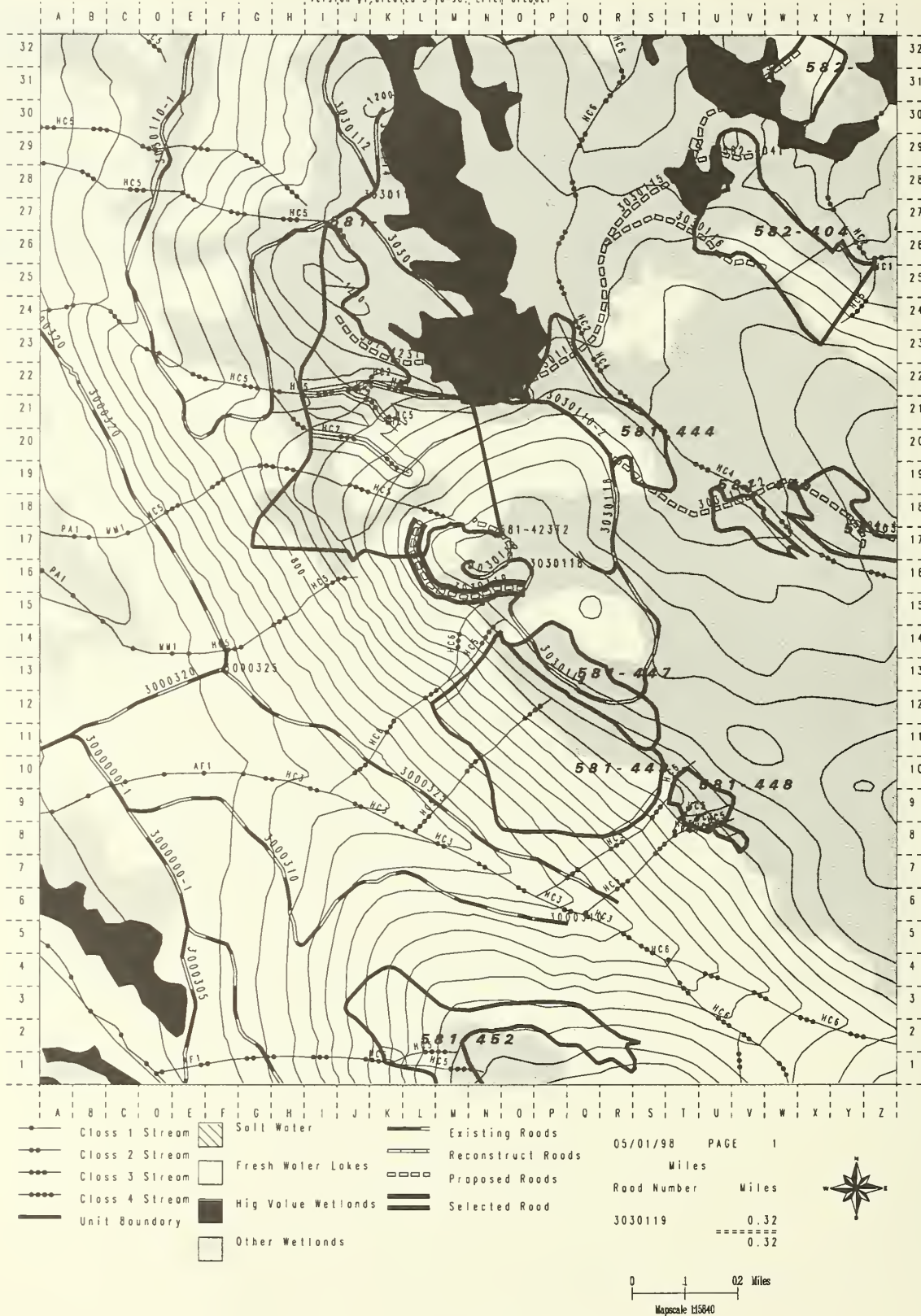
Photo #'s: 1090-6 & 7

NOTES

Luck Lake Project Area Draft Road Card 3030119

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Greboer



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030119</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.32</u>	
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New Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.32</u>	
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
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Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
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Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Road closed at Eagle Creek for safety, resource, and economic concerns.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030119 road accesses timber sale unit 581-423.

Silviculture:

Some potential for cultural treatments and salvage. Access will be limited to helicopter. Required reforestation will be completed using helicopter access.

Wildlife:

Subsistence use area.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:
The proposed 3030119 location presents a fairly high landslide risk. The route crosses the head of a class IV stream on slopes over 60 percent gradient. About 100 feet on slopes over 67 percent gradient. Full bench and end-haul construction may be necessary for 200 feet (BMP 14.7 and 14.12). Alternative routes should be fully considered (BMP 14.2). The route crosses about 100 feet of scrub-shrub poor fen wetland near the point of beginning. The wetland is unavoidable if the route is to be placed on a stable hillslope beyond the point of beginning. The wetland functions as a donor to the class IV stream below. Apply 33 CFR BMP's 5 and 6. This road is to be closed following harvest (BMP 14.22). The proposed road meets the requirements for silvicultural road exemption from the 404 permit process.
Road Location Narrative:
Road accesses Unit 582-423. The route is the shortest route to the harvest area. Other routes are longer increasing road density and wetland impacts.
Wetlands Avoidance:
The route is within an old harvest area and timber lands.
Rock Pits:
Stream Crossings:
No known stream crossings are on this road. No known fisheries concerns.

Road #: **3030119** Map #: Craig D-3 NE

Aerial Photo: Yr. 79

Line 12 36

Photo #'s: 379-47, 48 & 49

Aerial Photo: Yr. 91

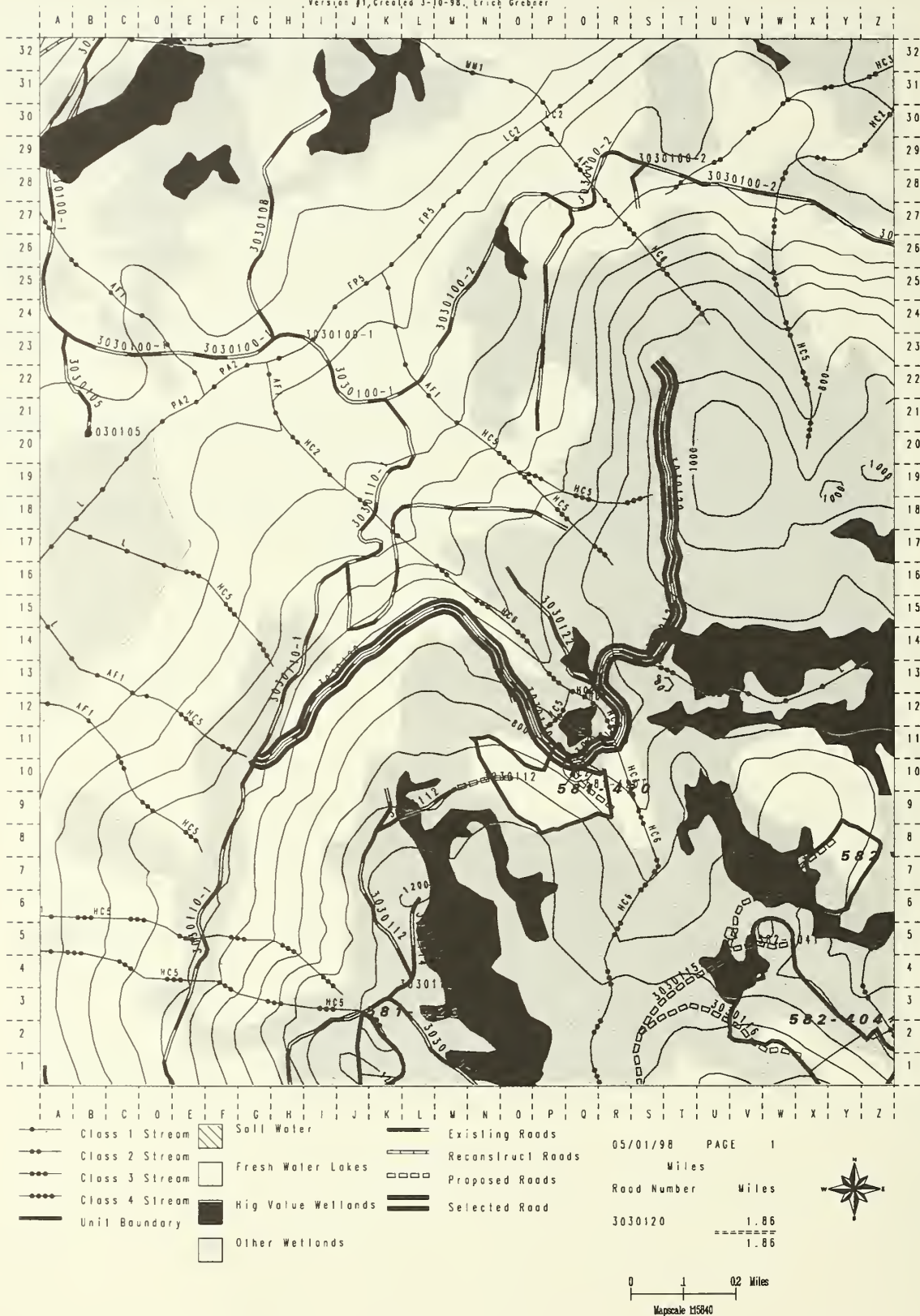
Line 28N

Photo #'s: 1090-6 7

NOTES

Luck Lake Project Area Draft Road Cord 3030120

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD			
Road No. <u>3030120</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.86</u>	
<u>N/A</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>1.86</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		<u>Inactive</u>	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:	Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.		
Prohibit:			
Closure Devices:	Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.		
Travel Management Narrative: Close road and remove pipes to eliminate potential for plugging pipes and road wash outs. Road closed at Eagle Creek for safety, resource, and economic concerns.			
Design Narrative Information:			
Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.			
Timber/Logging Systems:			
No concerns.			
Silviculture:			
Minor opportunity for cultural treatments. Moderate potential for salvage in the future. Access to unit 581-420 will be limited to helicopter for required reforestation work.			
Wildlife:			
No concerns.			
Visual/Recreation:			
Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			
Soils/Water:			
Existing road is open and drivable. Road to be closed to vehicular traffic (BMP 14.22). Waterbar all drainage structures (BMP 14.8). Evaluate risk of culvert failure on large water quality stream crossing at the time of closure. At a minimum waterbar the culvert if not pulled. (BMP's 14. 8).			

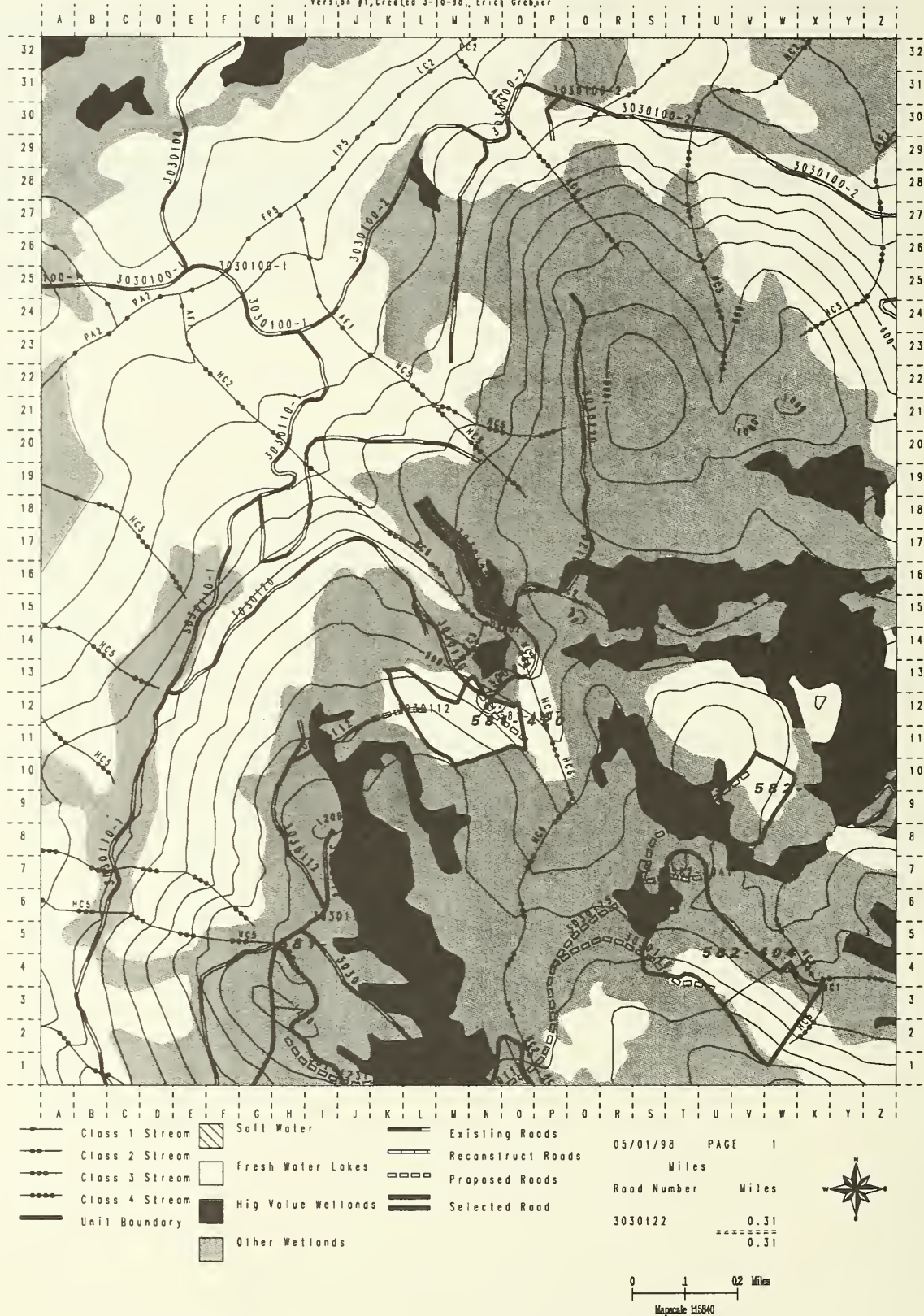
Road Location Narrative:
Existing Road accesses lower portion of unit 581-420.
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
No known stream crossings on this road. No known fisheries concerns.

Road #: 3030120 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 28N Photo #'s: 1090-4

NOTES

Luck Lake Project Area Draft Road Cord 3030122

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030122 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.31

N/A Construction (New or RE) Beginning M.P. 0.00 Length 0.31

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 1 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Close road and remove pipes to eliminate potential for plugging pipes and road wash outs. Road closed at Eagle Creek for safety, resources, and economic concerns.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. Road to be closed to vehicular traffic (BMP 14.22). Waterbar all drainage structures (BMP 14.8).

Road Location Narrative:				
Existing Road				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
Two Class IV stream crossings from field review during CPOW unit layout.				
A)MP: unknown	AHMU: Class IV	Channel Type	BF width	BF depth
	G/W			
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: In former CPOW unit 581-201.				
B)MP: unknown	AHMU: Class IV	Channel Type	BF width	BF depth
	G/W			
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: In former CPOW unit 581-201.				

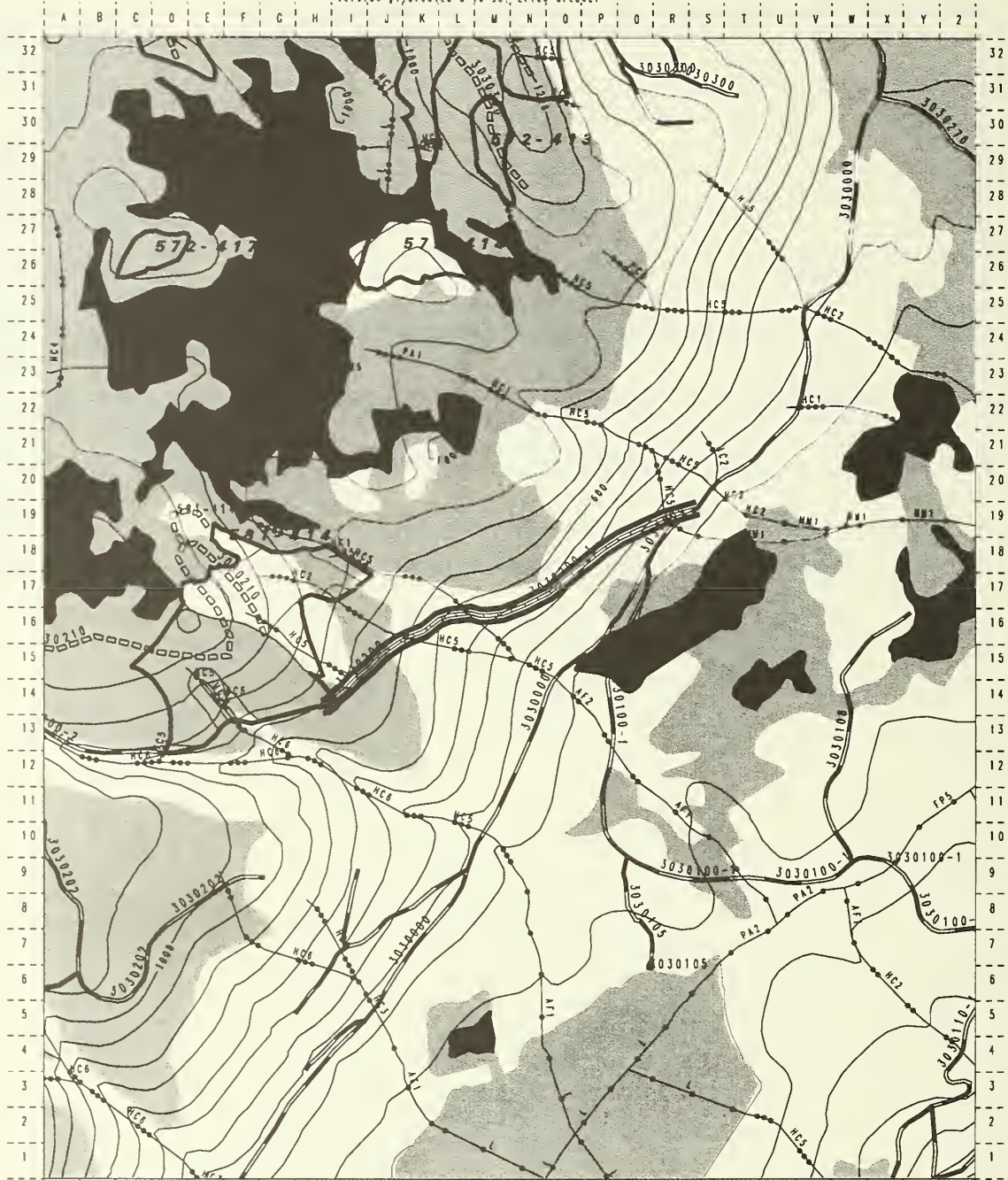
Road #: 3030122 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 28N Photo #'s: 1090-4

NOTES

Luck Lake Project Area Draft Road Cord 3030200-1

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



- | | |
|----------------|---------------------|
| Class 1 Stream | Salt Water |
| Class 2 Stream | Fresh Water Lakes |
| Class 3 Stream | High Value Wetlands |
| Class 4 Stream | Other Wetlands |
| Unit Boundary | |

- | |
|-------------------|
| Existing Roads |
| Reconstruct Roads |
| Proposed Roads |
| Selected Road |

11/06/98 PAGE 1
Miles
Road Number Miles
3030200-1 0.76
0.76



0 1 0.2 Miles
Mapscale 1:15840

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030200-1 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.76

RE Construction (New or RE) Beginning M.P. 0.00 Length 0.76

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 2

Intended Purpose and Use: Silvicultural activities and post sale access.

AFRPR Post Sale Status: Active

Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses units 581-414 and 581-435.

Silviculture:

No concerns. Road will access units 581-414 and 435 as well as existing harvest areas for current and future cultural treatments.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. Reconstruction is limited to ditchline cleanout and blading. Place any excavated material on stable upland sites if available (BMP 14.12, 12.5). Reseed ditchlines and remove slash from personal use timber harvest activities. BMP 14.8

Road Location Narrative:

Existing Road and new extension accesses Units 581-414 and 434. Reconstruct ditch, malfunctioning drainage structures, washed road surface and some brushing .

Wetlands Avoidance:

Existing road.

Rock Pits:**Stream Crossings:**

Four Class III, two Class IV O/W, and two Class IV G/W stream crossings based on GIS and field review. The stream crossings listed below are from the beginning to end of the existing road segment.

A) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Class I habitat, coho, immediately downstream.					
B) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 414-3.					
C) MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF depth	
Gradient %		Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 414-3A					
D) MP: unknown	AHMU: Class IV G/W	Channel Type: HC2	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 414-2					
E) MP: unknown	AHMU: Class III	Channel Type: HC5	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 414-4					
F) MP: unknown	AHMU: Class IV G/W	Channel Type: HC5	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: This is stream 414-1					
G) MP: unknown	AHMU: Class III	Channel Type: HC3	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Water quality stream.					
H) MP: unknown	AHMU: Class IV O/W	Channel Type: HC3	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Water quality stream					

Road #: 3030200-1 Map #: Craig D-3 NE

Aerial Photo: Yr. 91

Line 27N

Photo #'s: 1090-103

Aerial Photo: Yr. 71

Line 0032

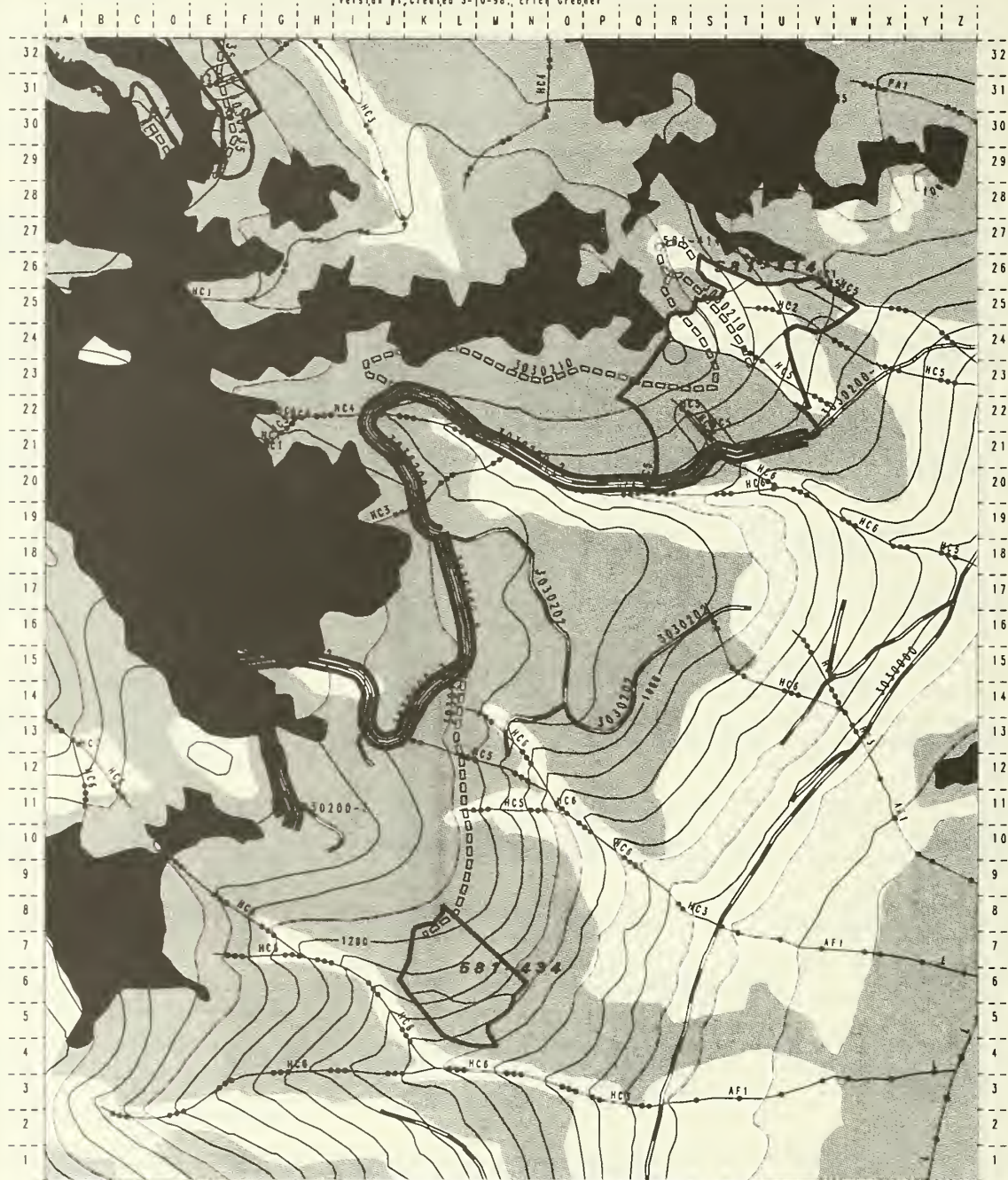
Photo #'s: 472 211, 212

NOTES

Luck Lake Project Area Draft Road Card 3030200-2

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebeier



- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Class 4 Stream
- Unit Boundary
- Salt Water
- Fresh Water Lakes
- High Value Wetlands
- Other Wetlands

- Existing Roads
- Reconstruct Roads
- Proposed Roads
- Selected Road

05/01/98 PAGE 1

Miles

Road Number Miles

3030200-2 2.28

2.28

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030200-2</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>2.28</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>0.76</u>	Length <u>2.28</u>
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>2</u>
Intended Purpose and Use: <u>Silvicultural activities and post sale access.</u>			

AFRPR Post Sale Status:	Active
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Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses units 581-414 and unit 581-434.

Silviculture:

Road accesses units 581-414 and unit 581-434 as well as existing harvest units for current and future cultural treatments.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. Reconstruction is limited to ditchline cleanout and blading. Place any excavated material on stable upland sites if available (BMP 14.12, 12.5). Reseed ditchlines and remove slash from personal use timber harvest activities. (BMP 14.8)

Road Location Narrative:				
Existing Road and new extension accesses Units 581-414 and 434.				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
One Class IV G/W crossing based on GIS interpretation.				
A) MP: unknown	AHMU: Class IV G/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Water quality stream.				

Road #: 3030200-2 Map #: Craig D-3 NE

Aerial Photo: Yr. 91

Line 26N

Photo #'s: 1090-214

NOTES

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98., Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030202 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.93

N/A Construction (New or RE) Beginning M.P. 0.00 Length 0.93

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Place in storage, pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road. Waterbar steep grades sufficiently to prevent road surface erosion.

Travel Management Narrative: Close road to reduce maintenance and road density.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns. Road 3030200-2 and 3030000 will remain open and provide sufficient access for cultural treatments.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable to the midpoint. Road to be closed to vehicular traffic (BMP 14.22). Waterbar all drainage structures (BMP 14.8).

Road Location Narrative:					
Existing Road					
Wetlands Avoidance:					
Existing road.					
Rock Pits:					
Stream Crossings:					
Two Class IV O/W stream crossings based in field review. The crossings are listed from the beginning to end of the existing road segment.					
A)MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Water quality stream.					
B)MP: unknown	AHMU: Class IV O/W	Channel Type: HC5	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Existing pulled culvert					

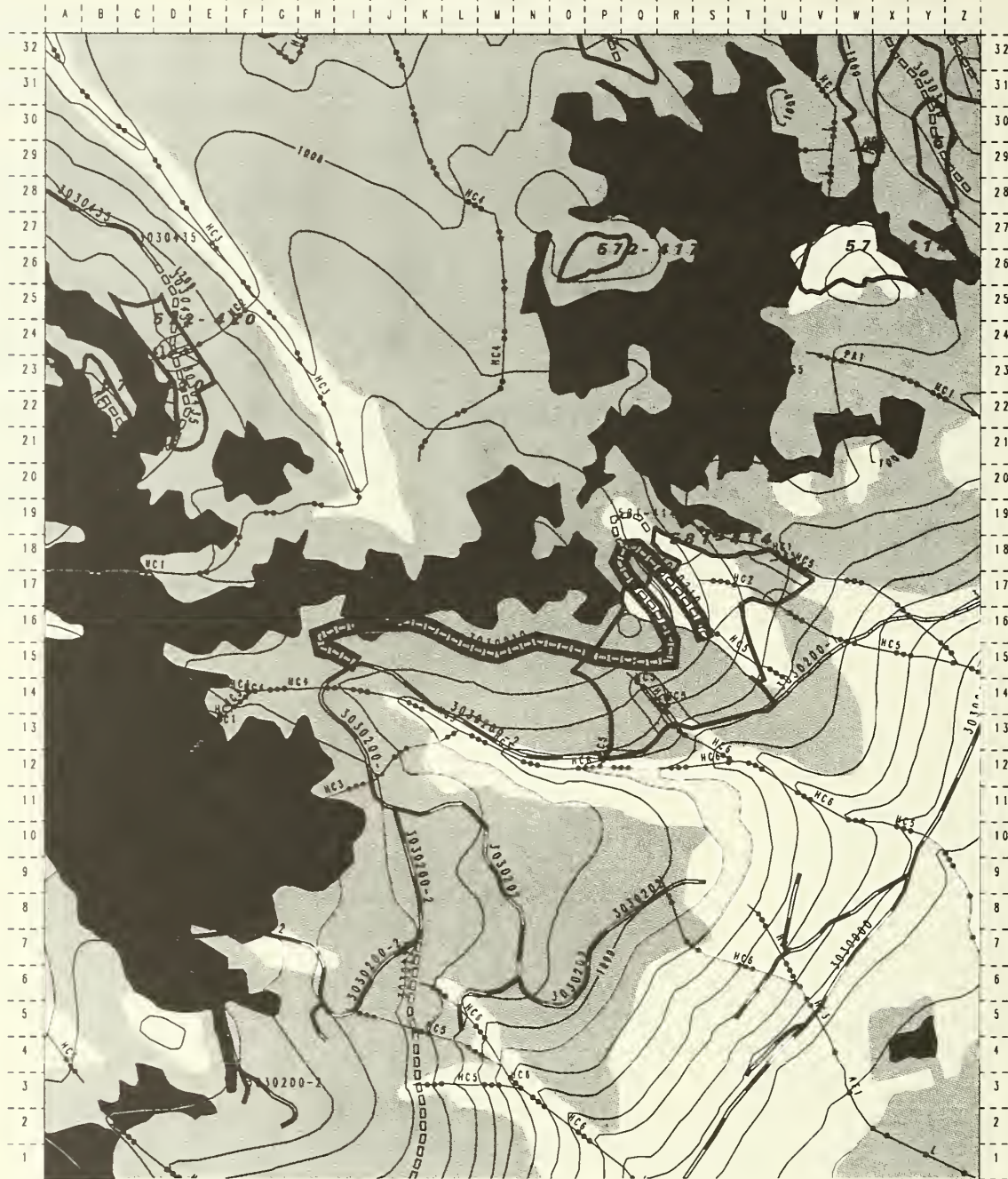
Road #: 3030202 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 27N Photo #'s: 1090-213

NOTES

Luck Lake Project Area Draft Road Card 3030210

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebner



- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Class 4 Stream
- Unit Boundary
- Salt Water
- Fresh Water Lakes
- High Value Wetlands
- Other Wetlands

- Existing Roads
- Reconstruct Roads
- Proposed Roads
- Selected Road

05/01/98 PAGE 1

Miles

Road Number Miles

3030210 1.17
1.17

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030210 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 1.17

New Construction (New or RE) Beginning M.P. 0.00 Length 1.17

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030210 road accesses timber sale unit 581-414.

Silviculture:

No concerns. Road 3030200 will remain open and provide sufficient access for required reforestation activities in unit 581-414.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

The 3030210 route crosses 20 to 40 percent sideslopes to access unit 581-414. Most of the 1.17 mile route traverses cedar-hemlock-blueberry-skunk cabbage forested wetlands below a high muskeg. Soils are mostly poorly drained organics 20 inches thick over bedrock. Road cross drainage will be critical for maintaining hillslope ground water flow patterns (BMP 14.9). Just north of unit 414 a switchback is located in a subalpine meadow to avoid a short, steep sideslope in the unit (BMP 14.2 and 14.7). Alternative routes from the north were considered but crossed a similar amount of wetland and failed to provide access to the upper part of unit 414. Access to the upper part of the unit is necessary to meet leave tree requirements and suspension requirements. Unit 414 could be helicopter logged but the costs do not outweigh the benefits. The 210 road is proposed for closure to vehicular traffic following harvest. The 210 road meets the requirements for the silvicultural road exemption from the 404 permit process. Apply 33 CFR BMP's 2, 4, 5, 7 and 8.

Road Location Narrative:

Road accesses Unit 581-414. A route from the east is longer, traverses more wetlands and steep ground. This route is on moderate terrain. Cuts and fills will be small.

Wetlands Avoidance:

The route traverses some small open bogs and fens, however, the route will be predominately in scrub forested wetlands. The switchback avoids an open bog. Location shown within high value wetlands is all within forested wetlands.

Rock Pits:**Stream Crossings:**

No known stream crossings on this road based on field review. No known fisheries concerns.

Road #: 3030210 Map #: Craig D-3 NE

Aerial Photo: Yr. 91

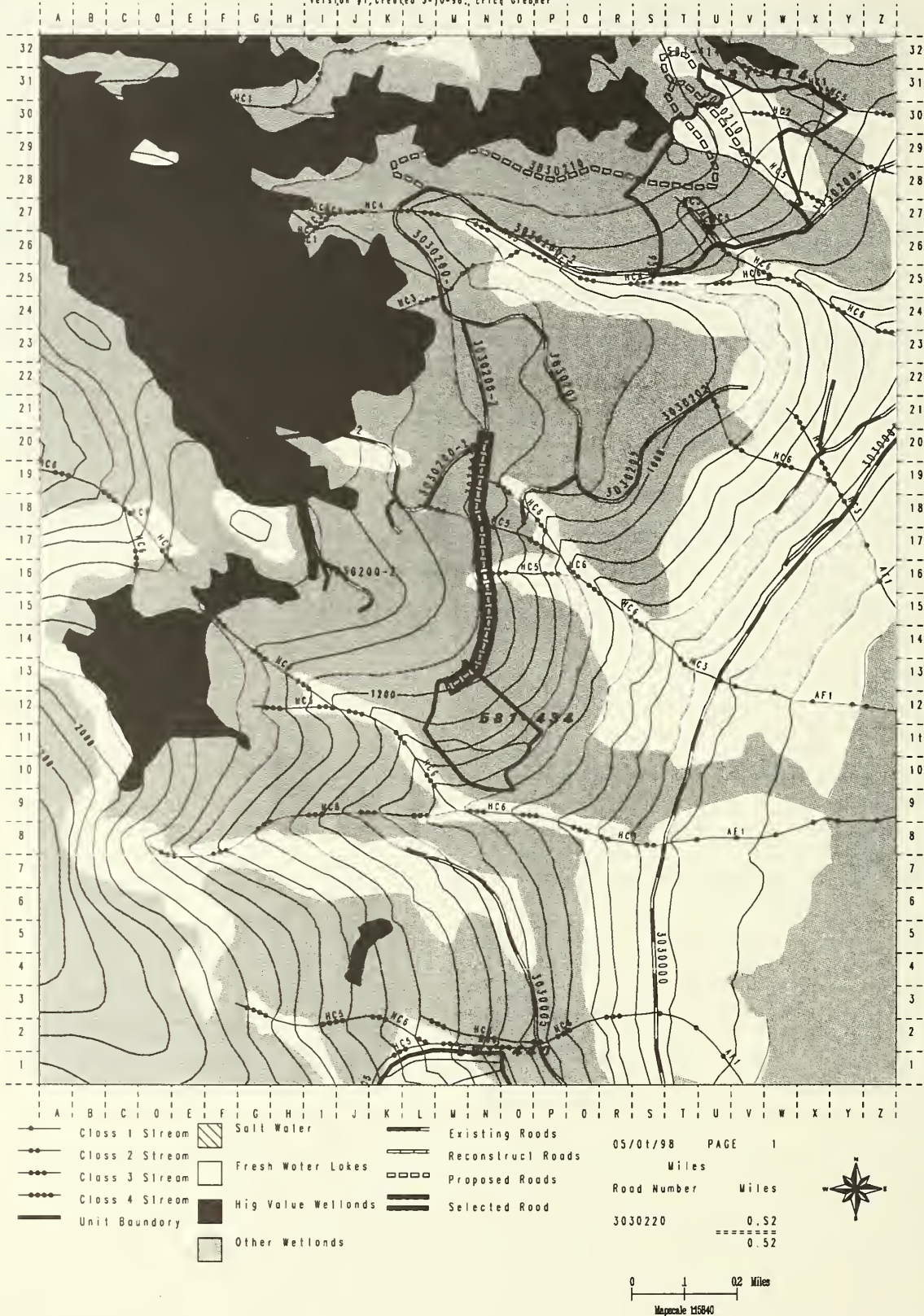
Line 27N

Photo #'s: 1090-103

NOTES

Luck Lake Project Area Draft Road Card 3030220

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030220 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.52

New Construction (New or RE) Beginning M.P. 0.00 Length 0.52

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030220 road accesses timber sale unit 581-434.

Silviculture:

Road closure will require access by foot or helicopter for required reforestation work in unit 581-434. No other concerns.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Luck Lake. No sidecast. Locate rockpit in area unseen from Luck Lake or mainline (3030000).

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

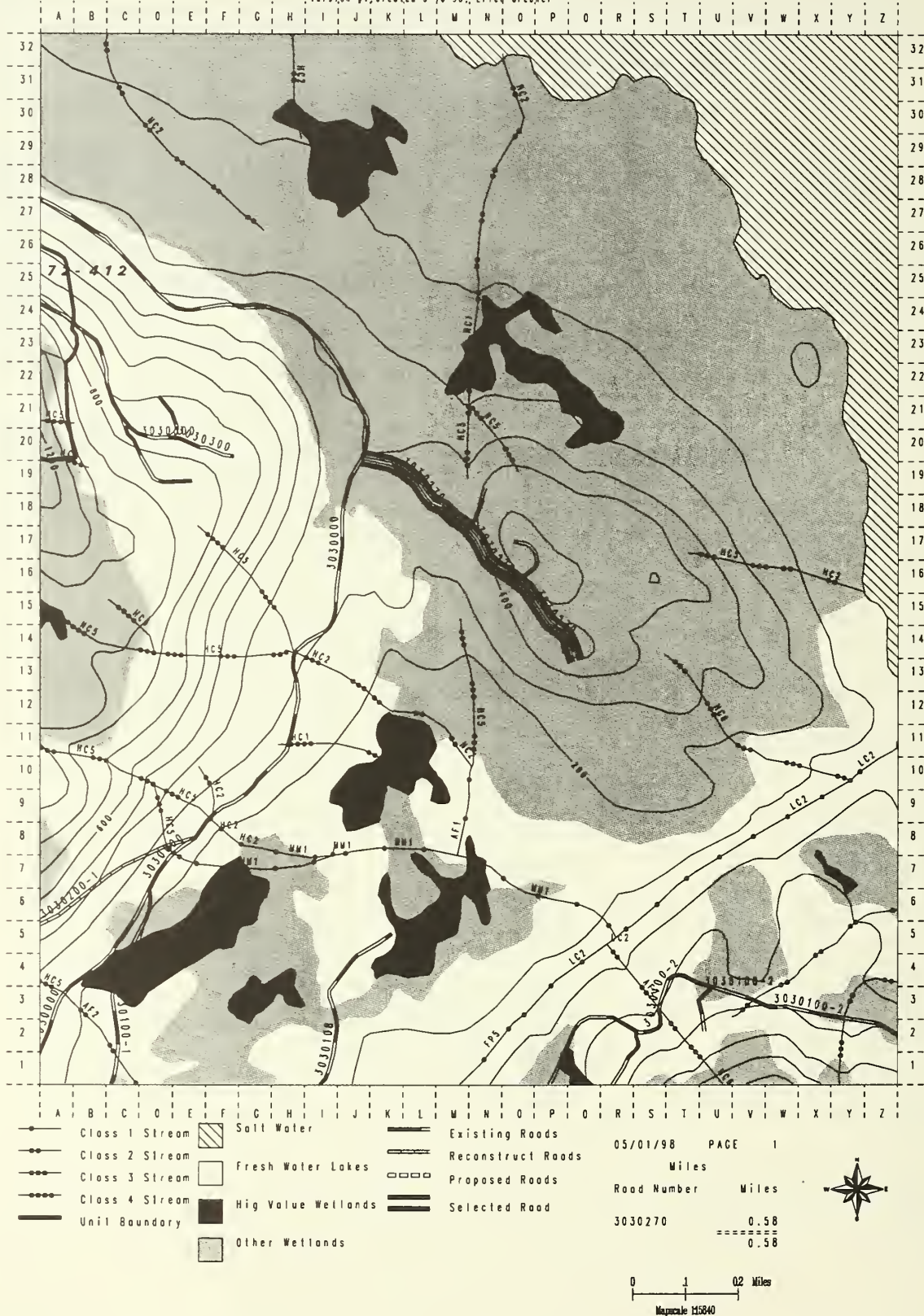
Soils/Water:
The proposed 220 route crosses nearly level terrain to access unit 434. The route is relatively easy construction and will mostly consist of rock overlay (BMP 14.8 and 14.9). The wet-hab map indicates mostly forested wetlands on the site. The route crosses cedar-hemlock-blueberry-skunk cabbage forested wetland and upland soils. No alternative route exists as the entire hillside is a complex of forested wetland and upland soils. Unit 434 could be helicopter yarded, however the benefits do not outweigh the costs given the relatively easy road opportunity. Apply 33 CFR BMP's 5, 7, & 8. The 220 road is proposed for closure to vehicular traffic after harvest (BMP 14.22). No high risk structures exist along the route. The 220 road as proposed meets the requirements for the silvicultural road exemption from the 404 permit process.
Road Location Narrative:
Road accesses Unit 581-434. This route is on moderate terrain . Cuts and fills will be small and location provides the least road density.
Wetlands Avoidance:
The route traverses some small open bogs and fens, however, the route will be predominately in forested wetlands.
Rock Pits:
Stream Crossings:
No known stream crossings are on this road based on GIS interpretation and unit field review.

Road #: 3030220 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 27N Photo #'s: 1090-103

NOTES

Luck Lake Project Area Draft Road Card 3030270

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030270</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.58</u>	
N/A Construction (New or RE)		Beginning M.P. <u>0.00</u>	Length <u>0.58</u>
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>N/A</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		Inactive	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:		Storage Pull pipes, create water bars, reseed slopes, and close the road near the beginning of the road.	
Prohibit:			
Closure Devices:		Remove approximately 100 ft. of roadbed and construct Tank trap near the beginning of the road.	
Travel Management Narrative: Road is currently closed at MP 0.2. Close road near the junction with the 3030 road.			
Design Narrative Information:			
Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.			
Timber/Logging Systems:			
No concerns.			
Silviculture:			
No concerns.			
Wildlife:			
Road is located in proposed Old-growth Reserve.			
Visual/Recreation:			
No concerns.			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			
Soils/Water:			
The existing road is closed with a tank trap. There are no known erosion concerns with this road. Forested and non-forested wetlands are present. Provide waterbars at all drainage structures (BMP 14.8).			

Road Location Narrative:
Existing Road
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
There are no known stream crossings on this road based on GIS interpretation. There are no known fisheries concerns.

Road #: 3030270 Map #: Craig D-3 NE

Aerial Photo: Yr. 91

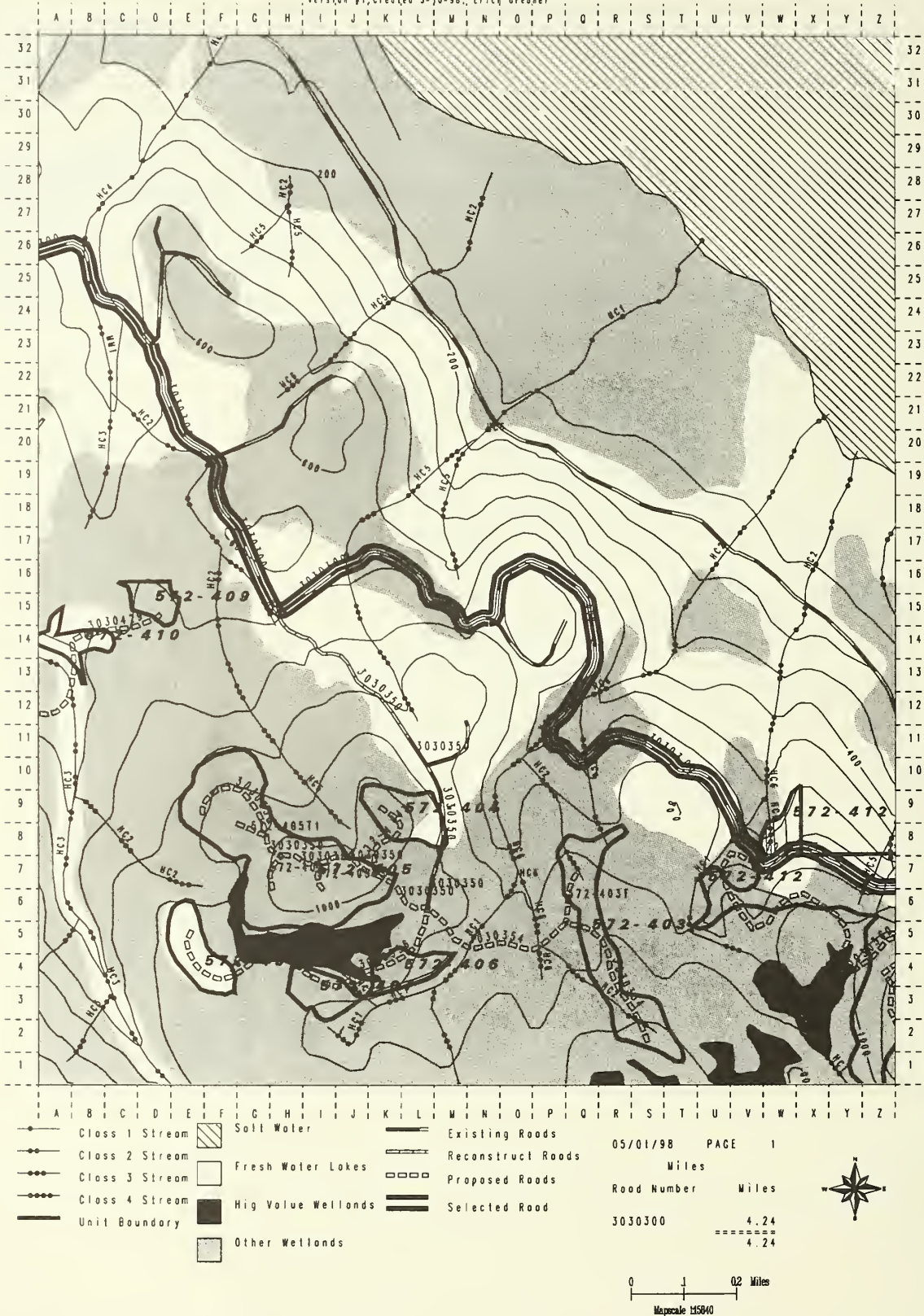
Line 28N

Photo #'s: 1090-3

NOTES

Luck Lake Project Area Draft Road Card 3030300

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030300</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>4.27</u>	
<u>N/A</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>4.27</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>C</u>	Hwy. Safety Act <u>No</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>2</u>
Intended Purpose and Use: <u>Silvicultural activities, commercial, recreation and community access.</u>			

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:	
Accept:	<u>MP 0.00 to 4.27.</u>
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Road use consists of local community traffic, state timber sales, and access to personal use timber.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H. with turnouts.

Timber/Logging Systems:

Clean ditches. Drainage and road surface repair.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

MP 0.0 to 1.5 lie within state land selection at Coffman Cove. The local community uses rock resources adjacent to this road.

Soils/Water:

The road is currently open and drivable. Reconstruction should establish drainage at HC6 stream downslope of unit 404 (BMP 14.8). Use BMP 14.12 to control excavation of sidecast material. Apply BMP 12.5 to avoid sidecast in wetlands.

Road Location Narrative:				
Existing Road .				
Wetlands Avoidance:				
Rock Pits:				
Stream Crossings:				
The one Class II B/W, and three Class III O/W stream crossings listed below are based on GIS interpretation. Stream characteristics are unknown at this time. The stream crossings are listed from the beginning of the road to the end.				
A) MP: unknown	AHMU: Class II B/W	Channel Type: MM1	BF width	BF depth
Gradient %	Structure	Passage: Yes	Timing dates: None	Substrate:
Narrative: Resident fish stream.				
B) MP: unknown	AHMU: Class III O/W	Channel Type: HC5	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: None	Substrate:
Narrative: Wate quality stream.				
C) MP: unknown	AHMU: Class III O/W	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: None	Substrate:
Narrative: Water quality stream.				
D) MP: unknown	AHMU: Class III O/W	Channel Type: HC1	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: None	Substrate:
Narrative: Water quality stream.				

Road #: 3030300 Map #: Craig D-3 NE

Aerial Photo: Yr. 91
Aerial Photo: Yr. 91

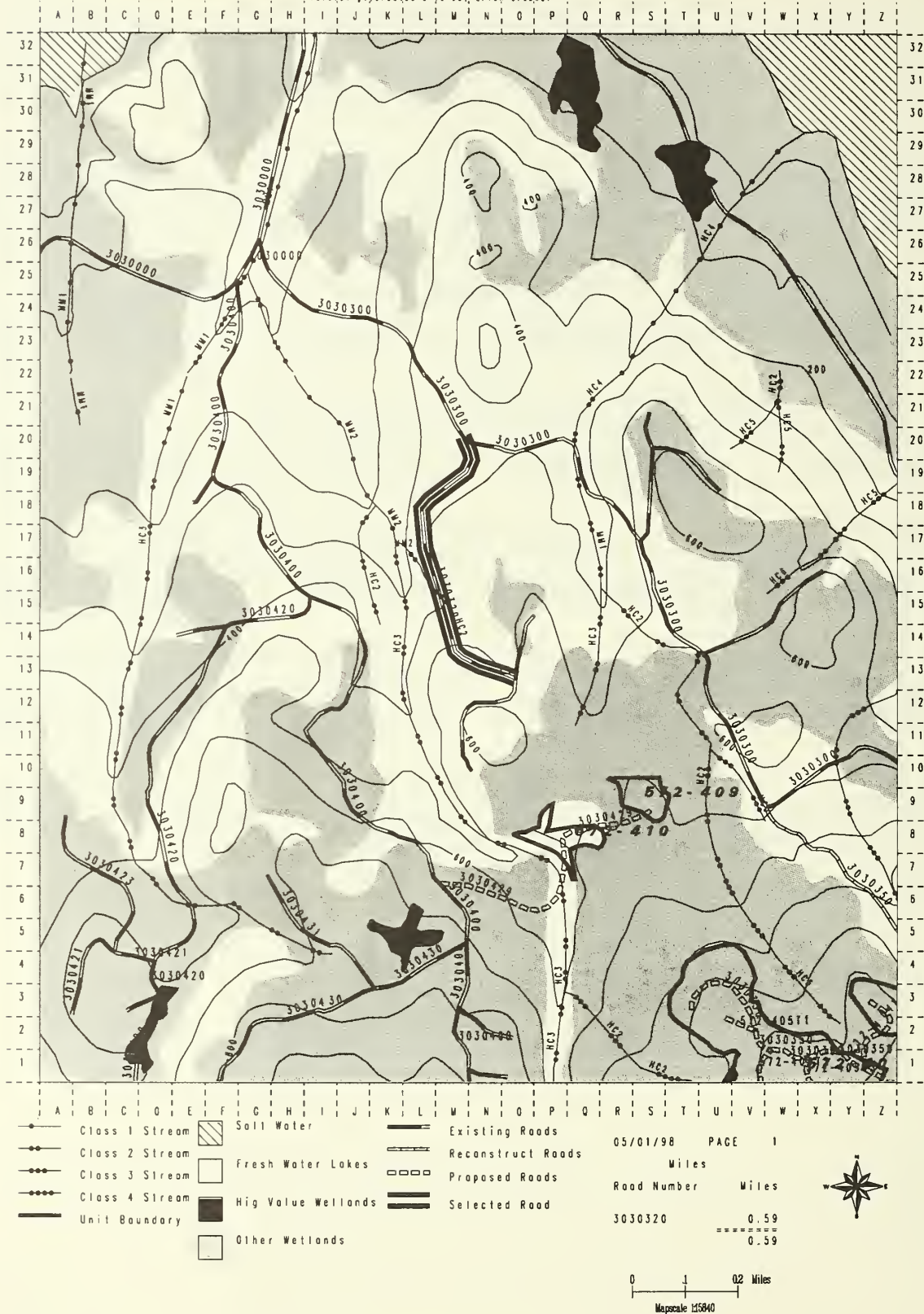
Line 27N
Line 26N

Photo #'s: 1090-101
Photo #'s: 1090-216

NOTES

Luck Lake Project Area Draft Road Card 3030320

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030320 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.59

N/A Construction (New or RE) Beginning M.P. 0.00 Length 0.59

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

See Travel management narrative below.

Prohibit:

Closure Devices:

Travel Management Narrative: Road is within lands conveyed to the State of Alaska. USFS retained an easement on this road. No joint maintenance agreements have been made with the State of Alaska or Coffman Cove community. CPOW road card indicates closure of this road. This road is revegetated. This road lies within the watershed which serves as the municipal water supply for Coffman Cove.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%; and 1 ft. ditch.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

No concerns.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Encourage continued road closure when discussing management options with the State of Alaska. The road lies adjacent to Chum Creek, which is the water source for the community of Coffman Cove.

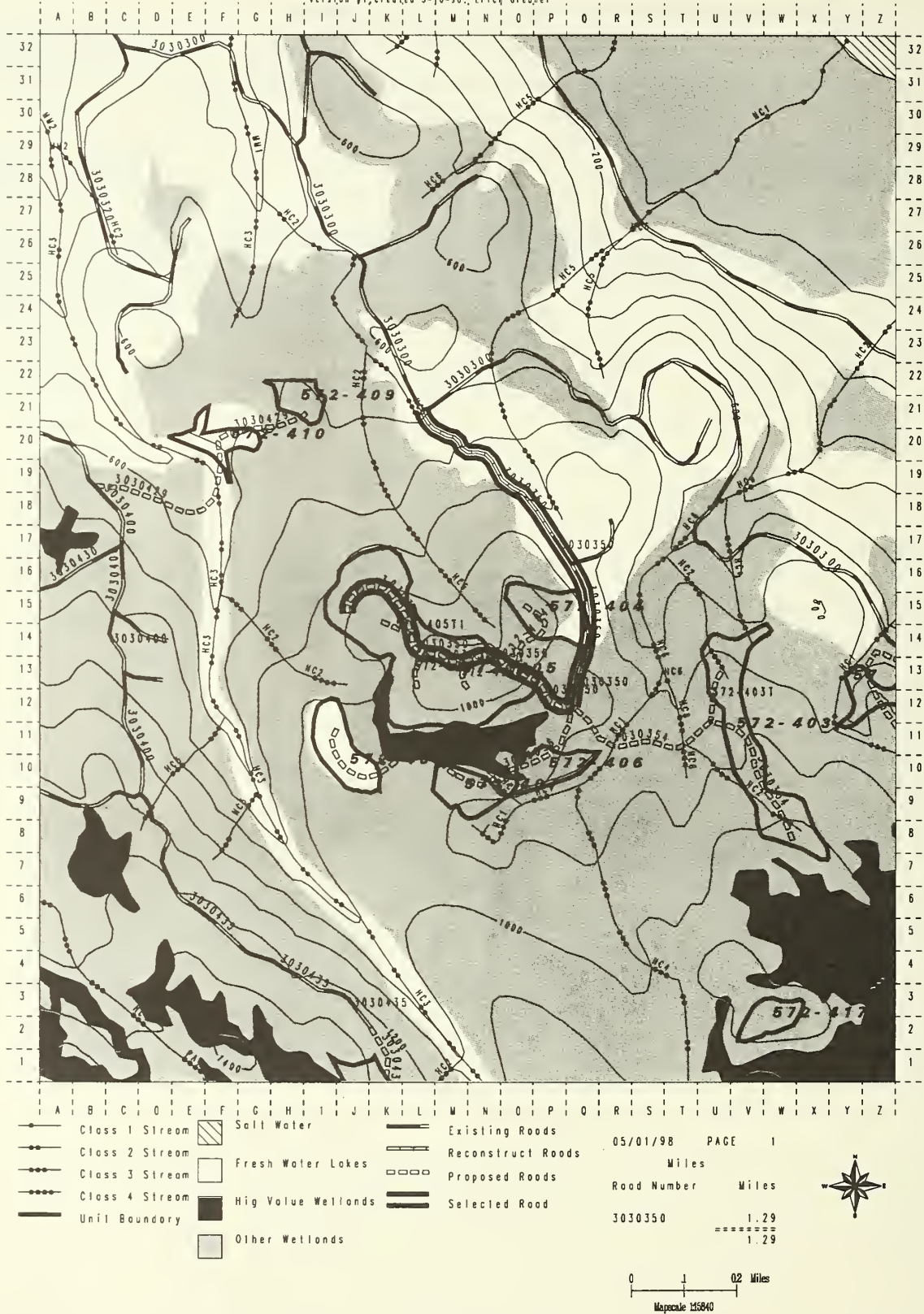
Road Location Narrative:					
Existing Road .					
Wetlands Avoidance:					
Existing road.					
Rock Pits:					
Stream Crossings:					
One Class II stream crossing based on GIS interpretation.					
A) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: This is a tributary to Chum Creek					

Road #: 3030320 Map #: Craig D-3 NE Aerial Photo: Yr. 71 Line 0031 Photo #'s: 472 221

NOTES

Luck Lake Project Area Draft Road Card 3030350

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030350</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.29</u>	
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RE Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.40</u>	
New Construction (New or RE)	Beginning M.P. <u>0.40</u>	Length <u>0.89</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			

AFRPR Post Sale Status:	Inactive
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Management Strategy:

Encourage:	
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Accept:	
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Discourage:	
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Eliminate:	Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.
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Prohibit:	
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Closure Devices:	Remove approximately 100 ft. of roadbed and construct tank trap at beginning of road.
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Travel Management Narrative: Close road for wildlife and reduced maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030350 road accesses timber sale unit 572-404.

Silviculture:

The 3030350 road accesses timber sale unit 572-404 and provides access to 572-403, 406, 407, 408. Road closure will also limit access proximity to 572-417. Access to these units will be by foot or helicopter for required reforestation work.

Wildlife:

Site-specific and road density concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove and Clarence Strait. No sidecast. Locate rockpit in area unseen from Coffman Cove or Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:
Reconstruction on the 3030350 road is expected to be slight. Use BMP 14.12 to control placement of sidecast material. New construction is proposed through forested wetlands. The road is located on the top of a small ridge. The entire unit consists of cedar-hemlock-blueberry-skunk cabbage forested wetland, so the wetland is unavoidable. No upland site exists for end-hauled material that will have less impacts to water quality than placement of sidecast away from streams. The wetlands donate water to downslope resources. A tall sedge fen lies immediately south of the harvest unit but is not impacted by the road. Helicopter yarding was considered, but not economical given the easy road construction opportunity (BMP 14.2 and 14.1). Some cut and fill will be required but slopes are less than 40 percent (BMP 12.5). Apply 33 CFR BMP's 1, 4, 5, 8, and 14. The 350 road meets the requirements for the silvicultural road exemption from the 404 permit process.
Road Location Narrative:
Existing Road and new extension accesses Units 572-403, 404, 405, 406 and 407.
Wetlands Avoidance:
The new extension avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible. Moving the route southerly would create more difficult stream crossings in deep notches and require larger cuts within open bogs as side slopes are steeper than the proposed route.
Rock Pits:
Stream Crossings:
No known stream crossings on this road based on GIS interpretation. No known fisheries concerns.

Road #: 3030350 Map #: Cr D-3 NE

Aerial Photo: Yr. 91
Aerial Photo: Yr. 91

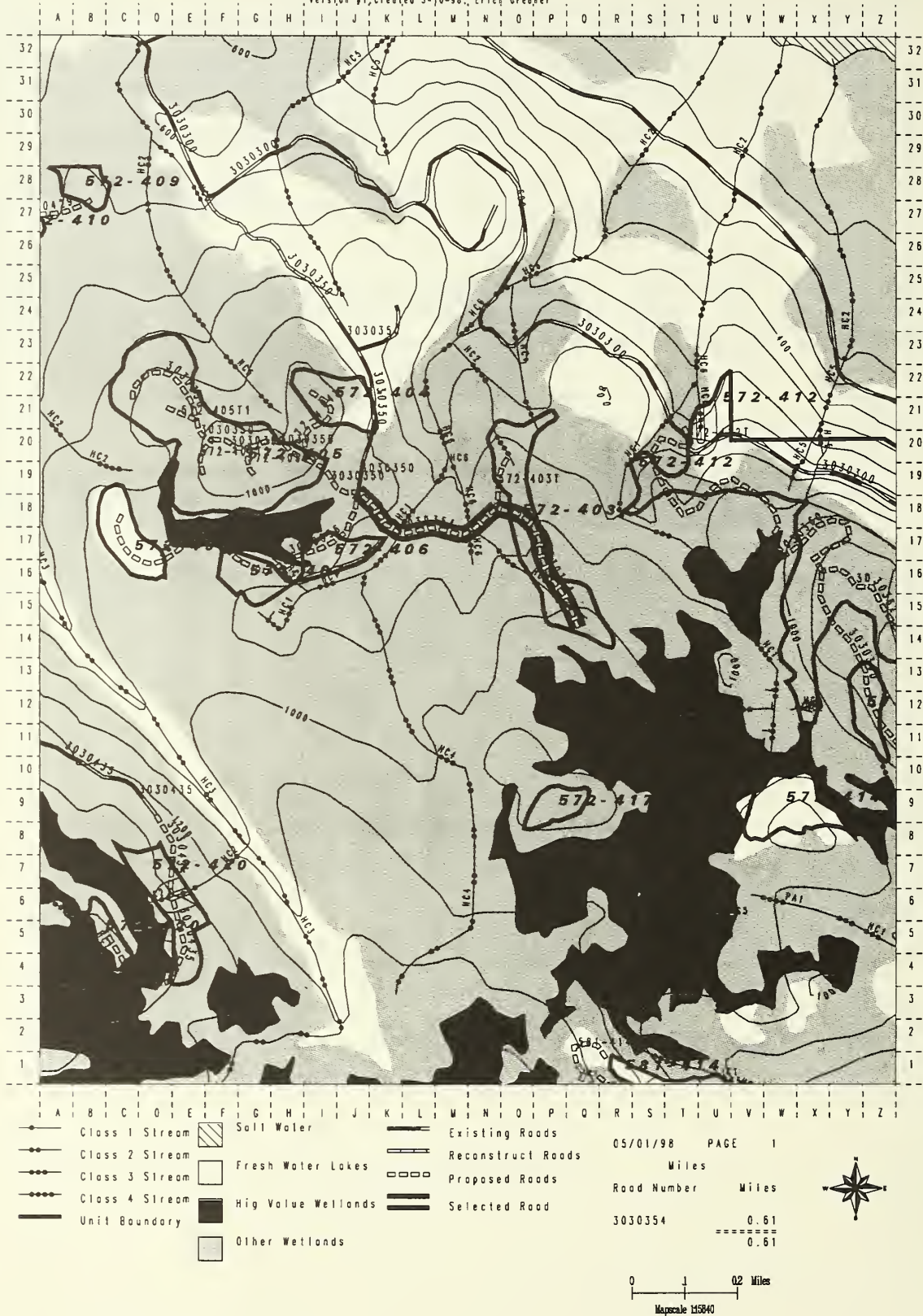
Line 27N
Line 26N

Photo #'s: 1090-101 & 102
Photo #'s: 1090-214, & 215

NOTES

Luck Lake Project Area Draft Road Card 3030354

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030354 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.61

New Construction (New or RE) Beginning M.P. 0.00 Length 0.61

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Close road for wildlife and reduced maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030354 road accesses timber sale unit 572-403.

Silviculture:

Access to unit 572-403 will be by foot or helicopter for required reforestation work.

Wildlife:

Site-specific and road density concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove and Clarence Strait. No sidecast. Locate rockpit in area unseen from Coffman Cove or Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

The proposed 3030354 road traverses slopes less than 40 percent gradient with two water quality stream crossings. The entire route is located in cedar-hemlock-blueberry-skunk cabbage forested wetlands and poor sedge fens. Use BMP's 14.9, 14.10, 14.12, 14.17, and 14.19 to control sidecast placement, pioneer road construction, provide timely erosion control and provide proper culvert installation (BMP 14.9 and 14.17). Unit 572-403 consists of cedar-hemlock-blueberry-skunk cabbage forested wetlands. No upland site exists for end-haul that will have less impact to water quality. Access to unit 572-403, while meeting grade requirements is best accomplished through the proposed route (33 CFR BMP 1). Helicopter yarding was considered, however given the relatively easy road access the benefits from helicopter yarding do not outweigh the costs. Apply 33 CFR BMP's 4, 5, 6, 7, 8, and 14. The proposed 3030354 road will be closed to vehicular traffic following timber harvest. The proposed 3030354 road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 572-403.

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.

Rock Pits:**Stream Crossings:**

One Class III O/W, two Class IV O/W stream crossings based on GIS interpretation. The information contained below is for the new construction from end of existing to end of road.

A) MP: unknown	AHMU: Class III, O/W	Channel Type: HC2	BF width	BF depth
Gradient %	Structure 48" cmp	Passage: No	Timing dates: none	Substrate:
Narrative: This stream is 406-1.				
B) MP: unknown	AHMU: Class IV, O/W	Channel Type: HC6	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: Water quality stream.				
C) MP: unknown	AHMU: Class IV, O/W	Channel Type: HC2	BF width	BF depth
Gradient %		Passage: No	Timing dates: none	Substrate:
Narrative: This stream is 403-1.				

Road #: 3030354 Map #: Craig D-3 NE

Aerial Photo: Yr. 91

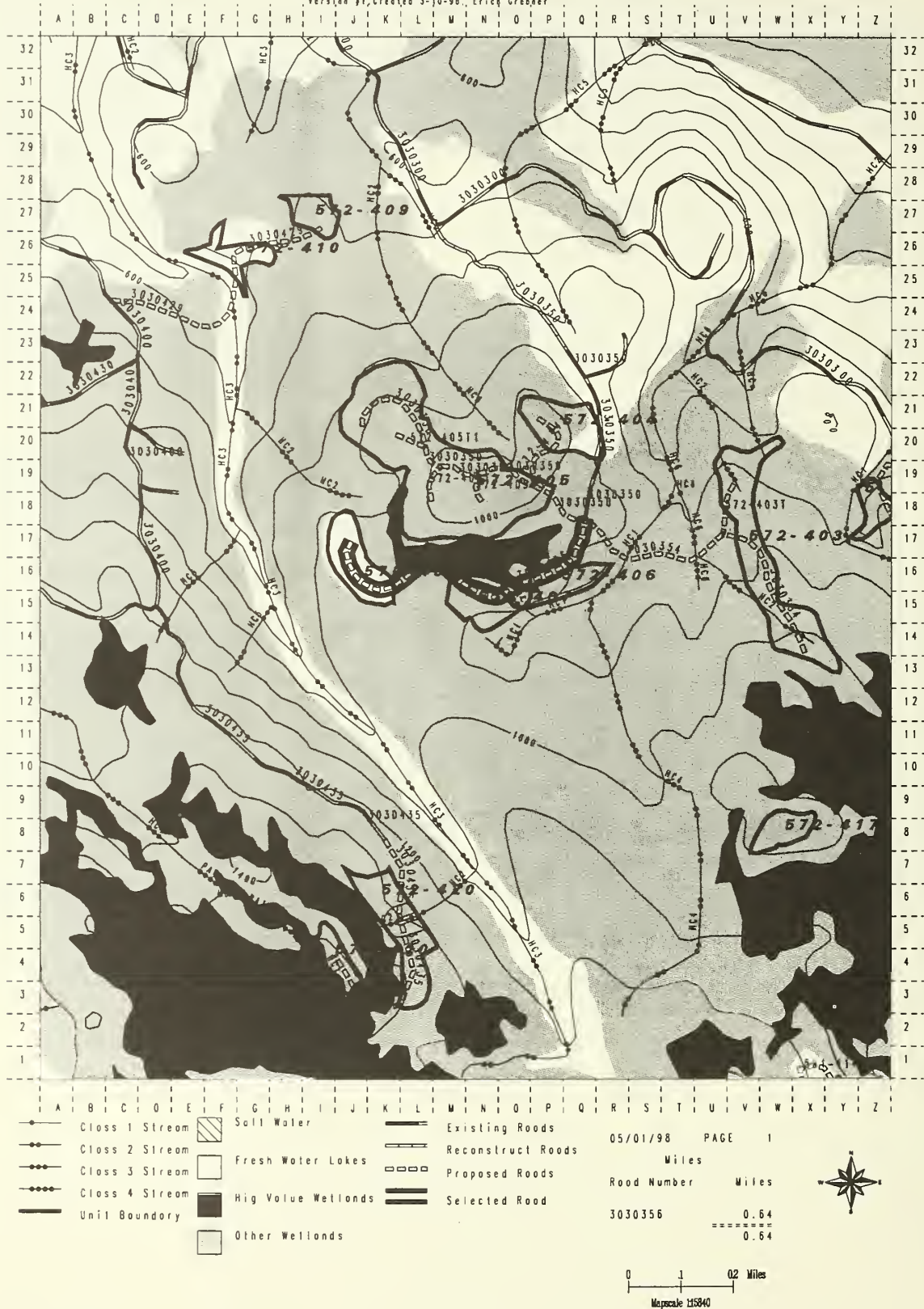
Line 27N

Photo #'s: 1090-101

NOTES

Luck Lake Project Area Draft Road Cord 3030356

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-90, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD			
Road No. <u>3030356</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.64</u>	
<u>New</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.64</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		Inactive	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:		Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.	
Prohibit:			
Closure Devices:		Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.	
Travel Management Narrative: <u>Close road for wildlife and reduced maintenance costs.</u>			
Design Narrative Information:			
Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.			
Timber/Logging Systems:			
The 3030356 road accesses timber sale units 572-406, 407 and 408.			
Silviculture:			
Access to units 572-406, 407 and 408 will be by foot or helicopter for required reforestation work.			
Wildlife:			
Site-specific and road density concerns.			
Visual/Recreation:			
Minimize cuts and fills visible to Coffman Cove and Clarence Strait. No sidecast. Locate rockpit in area unseen from Coffman Cove or Clarence Strait.			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			

Soils/Water:

The mapped road route traverses sideslopes less than 30 percent gradient in hemlock-spruce-skunk cabbage forested wetlands and uplands. The mapped route also crosses a tall sedge fen with high resource values. Field investigations indicate that units 572-406, 407 and 408 can be accessed while avoiding the tall sedge fen. (BMP 14.1 and 33 CFR BMP 1). No road route has been flagged on the ground yet. A location in the forested areas will involve more small stream crossings than a location in the tall sedge fen wetland, however benefits may outweigh costs. The forested wetlands donate water to the water quality stream south of the units. Through the forested wetlands apply 33 CFR BMP's 4, 5, 6, 7, 8, and 14. The proposed route will be closed to vehicular traffic following timber harvest. The proposed 356 road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 572-406, 407 and 408. Route is the most direct route minimizing road density, wetland impacts and maintenance.

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.

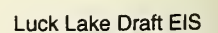
Rock Pits:**Stream Crossings:**

No known stream crossings on new construction based on field review. No known fisheries concerns.

Road #: 3030356 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 26N Photo #'s: 1090-215 & 216

NOTES

Mopscote 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030360 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 1.23

New Construction (New or RE) Beginning M.P. 0.00 Length 1.23

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Close road for wildlife and reduced maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030360 road accesses timber sale units 572-412 and 572-413.

Silviculture:

No concerns as planned.

Wildlife:

Site-specific and road density concerns.

Visual/Recreation:

Minimize cuts and fills visible to Clarence Strait. No sidecast. Locate rockpit in area unseen from Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

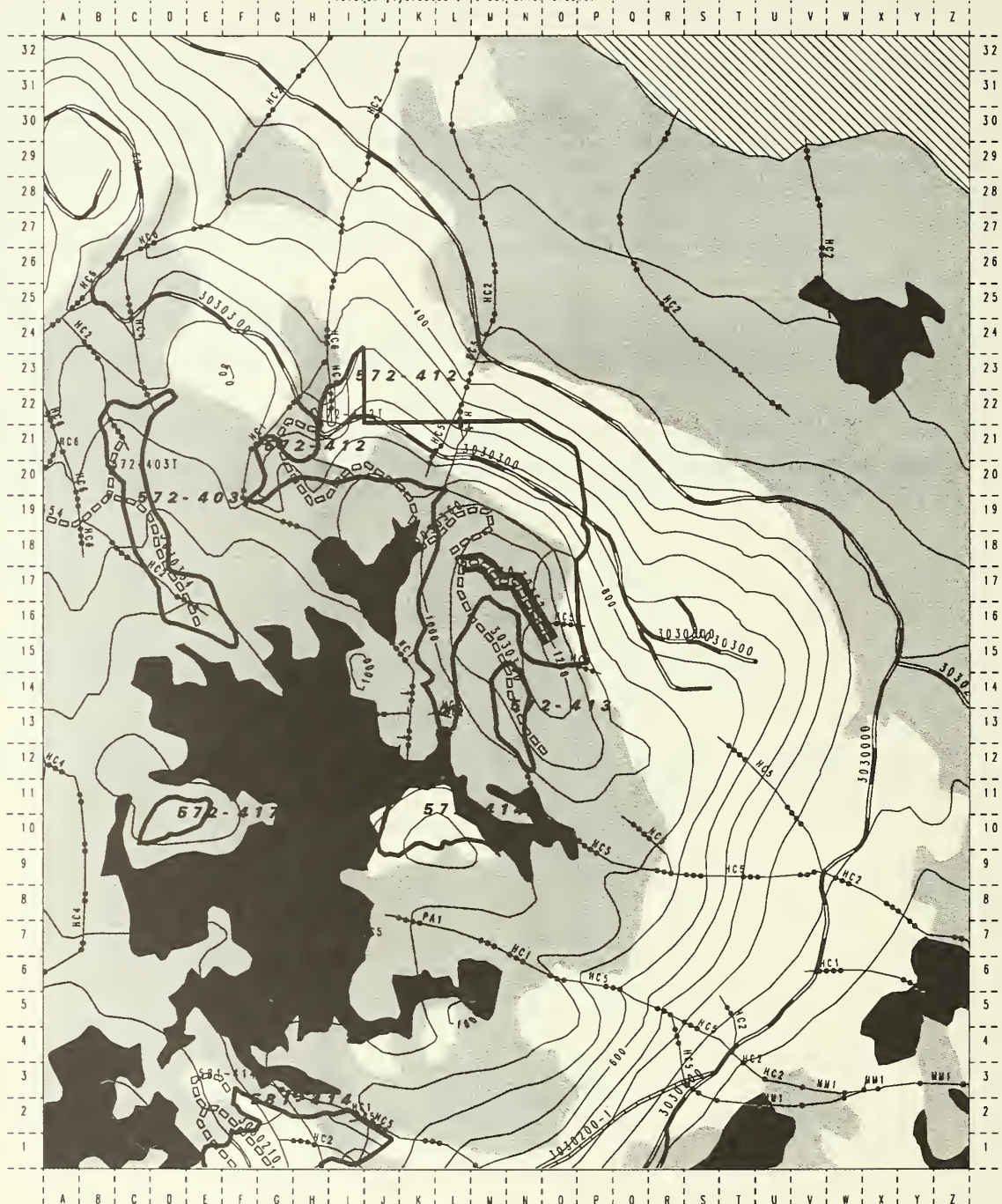
Soils/Water:
The proposed 3030360 road includes two short steep pitches of moderate difficulty construction with the remainder relatively easy construction on sideslopes less than 30 percent gradient. Control of excavated material is critical (BMP 14.12 and 14.19). When working next to the water quality stream near the point of beginning and in the poor sedge fen. The short steep pitch after the switchback contours on slopes over 40 percent gradient. Full bench construction may be necessary (BMP 14.8). The 3030360 route crosses a cedar-hemlock-blueberry-skunk cabbage forested wetland on sloping ground and a poor sedge fen on slopes less than 10 percent gradient. The poor sedge fen is located on a low rise between two water quality streams and transfers water to the water quality streams downslope. The Forested wetland donates water downslope to a small pond and poor sedge fen. There is an existing road through unit 572-412, however the road does not allow uphill yarding necessary to meet soil protection requirements and reserve tree requirements. Helicopter yarding was considered but is not economical considering the relatively easy road construction. Apply 33 CFR BMP's 2, 4, 5, 6, 8, and 14. The 3030360 road is proposed for closure following timber harvest. The 3030360 road meets the requirements for the silvicultural road exemption from the 404 permit process.
Road Location Narrative:
Road accesses Units 572-412 and 413. A route from the end of 3030300 was considered. That route would traverse more wetlands, require 0.75 mile additional road to reach the same harvest area.
Wetlands Avoidance:
The route crosses two fens to reach the harvest area. The road is located within timbered areas as much as possible. When crossing open bogs and fens, the route is located to minimize cut sections and drainage interruption as much as possible. The footprint of the road within these wetlands will be minimal as the terrain is flat.
Rock Pits:
Stream Crossings:
No known stream crossings exist for the new construction based on GIS interpretation.

Road #: 3030360	Map #: Craig D-3 NE	Aerial Photo: Yr. 91	Line 27N	Photo #'s: 1090-101
		Aerial Photo: Yr. 71	Line 0032	Photo #'s: 472 212

NOTES

Luck Lake Project Area Draft Road Card 3030362

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebner



- | | | |
|--------------------|-----------------------|---------------------|
| —●— Class 1 Stream | ▨ Salt Water | — Existing Roads |
| —●— Class 2 Stream | □ Fresh Water Lakes | — Reconstruct Roads |
| —●— Class 3 Stream | ■ High Value Wetlands | □ Proposed Roads |
| —●— Class 4 Stream | □ Other Wetlands | — Selected Road |
| — Unit Boundary | | |

05/01/98 PAGE 1
Miles
Road Number Miles
3030362 0.23
===== 0.23

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030362 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.23

New Construction (New or RE) Beginning M.P. 0.00 Length 0.23

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Tributary to 3030360

Travel Management Narrative: Close road for wildlife and reduced maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030362 road provides access to timber sale unit 572-412.

Silviculture:

No concerns.

Wildlife:

Site-specific and road density concerns.

Visual/Recreation:

Minimize cuts and fills visible to Clarence Strait. No sidecast. Locate rockpit in area unseen from Clarence Strait.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

The proposed 3030362 road consists of 0.23 miles of construction on sideslopes less than 20 percent gradient. Very little cut and fill is anticipated. The site is mapped as forested wetland but is mostly upland. BMP's 14.12, 14.22 and 14.19 apply. The 3030362 road is proposed for closure following harvest. The 3030362 road is exempt from the 404 permit process as it is located on uplands.

Road Location Narrative:
Road accesses Unit 572-412 .
Wetlands Avoidance:
The road is located within harvest area.
Rock Pits:
Stream Crossings:
No known stream crossings exist for the new construction based on GIS interpretation.

Road #: 3030362 Map #: Craig D-3 NE

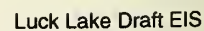
Aerial Photo: Yr. 91
Aerial Photo: Yr. 71

Line 27N
Line 0032

Photo #'s: 1090-103
Photo #'s: 472 212

NOTES

Mopscote 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030429 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.53

New Construction (New or RE) Beginning M.P. 0.00 Length 0.53

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Close road for wildlife, municipal watershed, and reduced maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030429 road accesses timber sale units 572-409 and 572-410.

Silviculture:

Road closure will result in use of foot access to accomplish required reforestation work in units 572-409 and 410.

Wildlife:

Site-specific and road density concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

The 3030429 road crosses cedar-hemlock-blueberry-skunk cabbage forested wetlands and poor sedge fens. The route also crosses a substantial V-notch with 30 feet of incision. The V-notch has extremely steep till sideslopes. The route is buildable, but the V-notch crossing can be avoided (BMP 14.1 and 14.2). The V-notch crossing on Chum Creek is about a mile upstream of the community water supply for Coffman Cove. Extra care should be taken when locating oil pollution prevention (BMP's 12.8 and 12.9). The proposed 3030429 route does not meet the requirements for the silvicultural exemption from the 404 permit process as it fails to minimize impacts to wetlands and waters of the United States. An alternative route from the east would cross two smaller streams with less impacts to water quality and fisheries. The impacts to wetlands would be similar, but on gentler slopes.

The present location does not meet BMP's for wetlands or water quality because other routes are available.

Recommend relocation.

Road Location Narrative:

Road accesses Units 572-409 and 410. The route has the most favorable terrain and stream crossings.

Wetlands Avoidance:

The road is located within timbered areas as much as possible. When crossing open bogs and fens, the route is located to minimize cut sections and drainage interruption as much as possible. The footprint of the road within these wetlands will be minimal as the terrain is flat.

Rock Pits:**Stream Crossings:**

One Class I B/W stream crossing is known for the new construction. The information contained below is for the new construction from the end of existing to the end of road. **Recommend relocation of this road to avoid steep V-notch crossing (see Soils) or use helicopter to harvest units.**

A) MP: unknown	AHMU: Class I, B/W	Channel Type: HC3	BF width	BF depth	
Gradient %	Structure	Passage: Yes	Timing dates: 7/15 to 8/15	Substrate:	

Narrative: This stream crossing is mainstem Chum Creek (ADF&G # 106-30-10120), located ~ one mile above the community water supply of Coffman Cove. Incision is 20-40 ft., gravel/bedrock substrate, active channel width 15 ft., 6-10 % gradient. **Apparently a culvert is proposed for this site. Recommend relocation of this road to avoid steep V-notch crossing which will require alot of fill. If relocation not possible, recommend bridge with no equipment crossing. This is a catalogued ADF&G coho stream.**

Road #: **3030429** Map #: Craig D-3 NE

Aerial Photo: Yr. 91

Line 26N

Photo #'s: 1090-216

Aerial Photo: Yr. 71

Line 0031

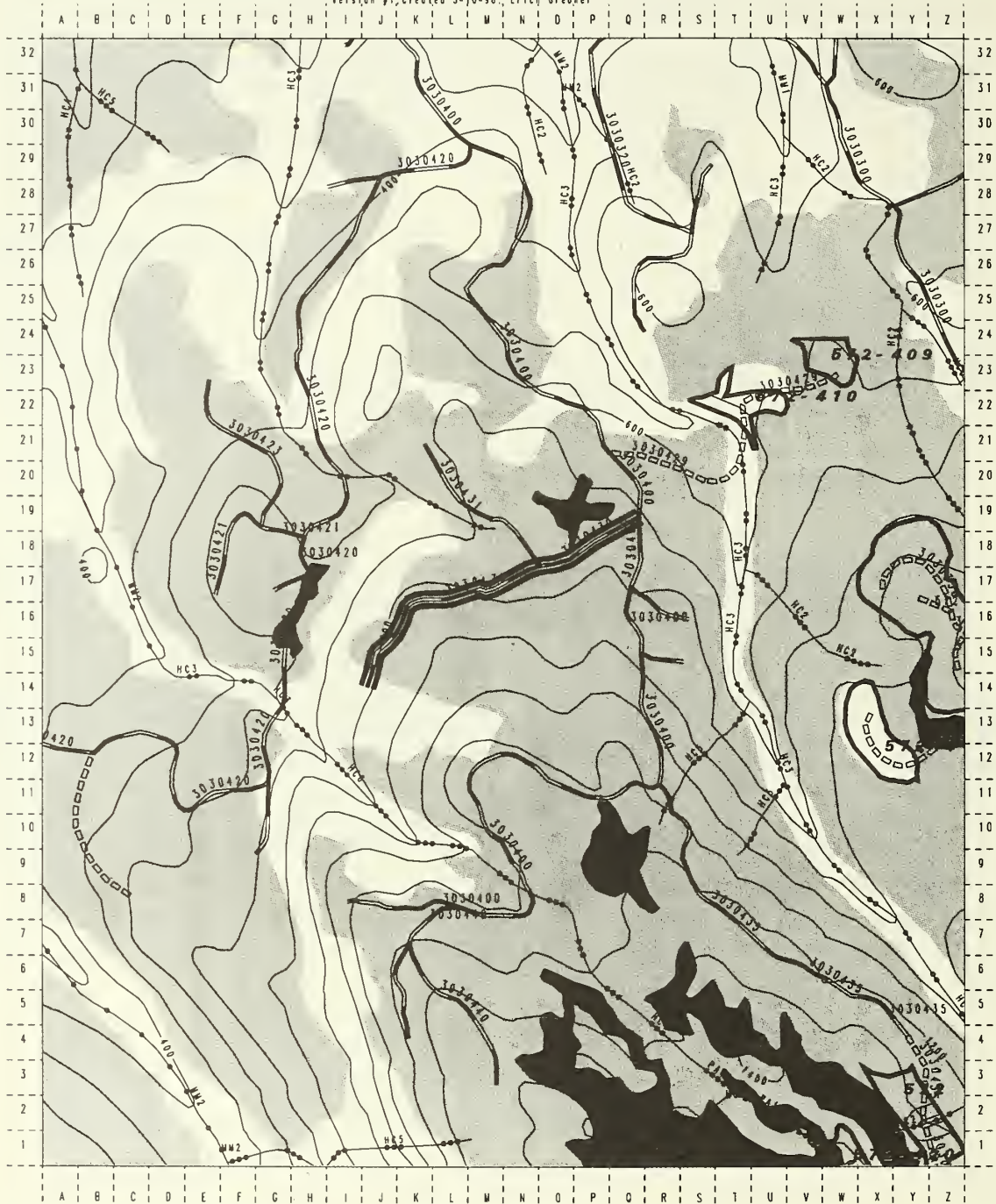
Photo #'s: 472 221, 472 222

NOTES

Luck Lake Project Area Draft Road Card 3030430

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Greber



- Class 1 Stream
- Class 2 Stream
- Class 3 Stream
- Class 4 Stream
- Unit Boundary
- Salt Water
- Fresh Water Lakes
- High Value Wetlands
- Other Wetlands

- Existing Roads
- Reconstruct Roads
- Proposed Roads
- Selected Road

05/01/98 PAGE 1
Miles
Road Number Miles
3030430 0.61
===== 0.61

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030430 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.61

N/A Construction (New or RE) Beginning M.P. 0.00 Length 0.61

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT
 Critical Veh.: LB Maint. Level: 1 Active Sale N/A Post Sale 1
 Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road. Waterbar steep grades sufficiently to prevent road surface erosion.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%;

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. High risk stream crossings should be removed or ditched. Waterbar remaining stream crossings (BMP 14.8 and 14.9.) Discourage vehicular access (BMP 14.22). Keep any excavated material out of the wetland located at the beginning of the road. (BMP 12.5 and 33 CFR BMP 5.

Road Location Narrative:
Existing Road
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
No known stream crossings on this road reconstruction based on GIS interpretation.

Road #: 3030430 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 26N Photo #'s: 1090-216

NOTES

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030431</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.31</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.31</u>	
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
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Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>N/A</u>	Post Sale <u>1</u>
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Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status:	<u>Inactive</u>
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Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road. Waterbar steep grades sufficiently to prevent road surface erosion.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%.

Timber/Logging Systems:

No concerns.

Silviculture:

No concerns.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Existing road is open and drivable. High risk stream crossings should be removed. Waterbar remaining stream crossings (BMP 14.8 and 14.9.) Discourage vehicular access (BMP 14.22).

Road Location Narrative:
Existing Road
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
No known stream crossings on this road reconstruction based on GIS interpretation.

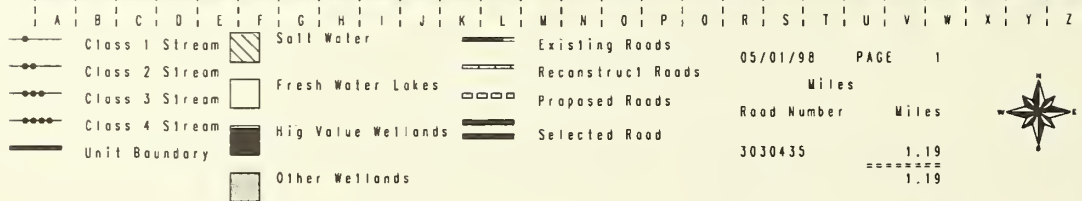
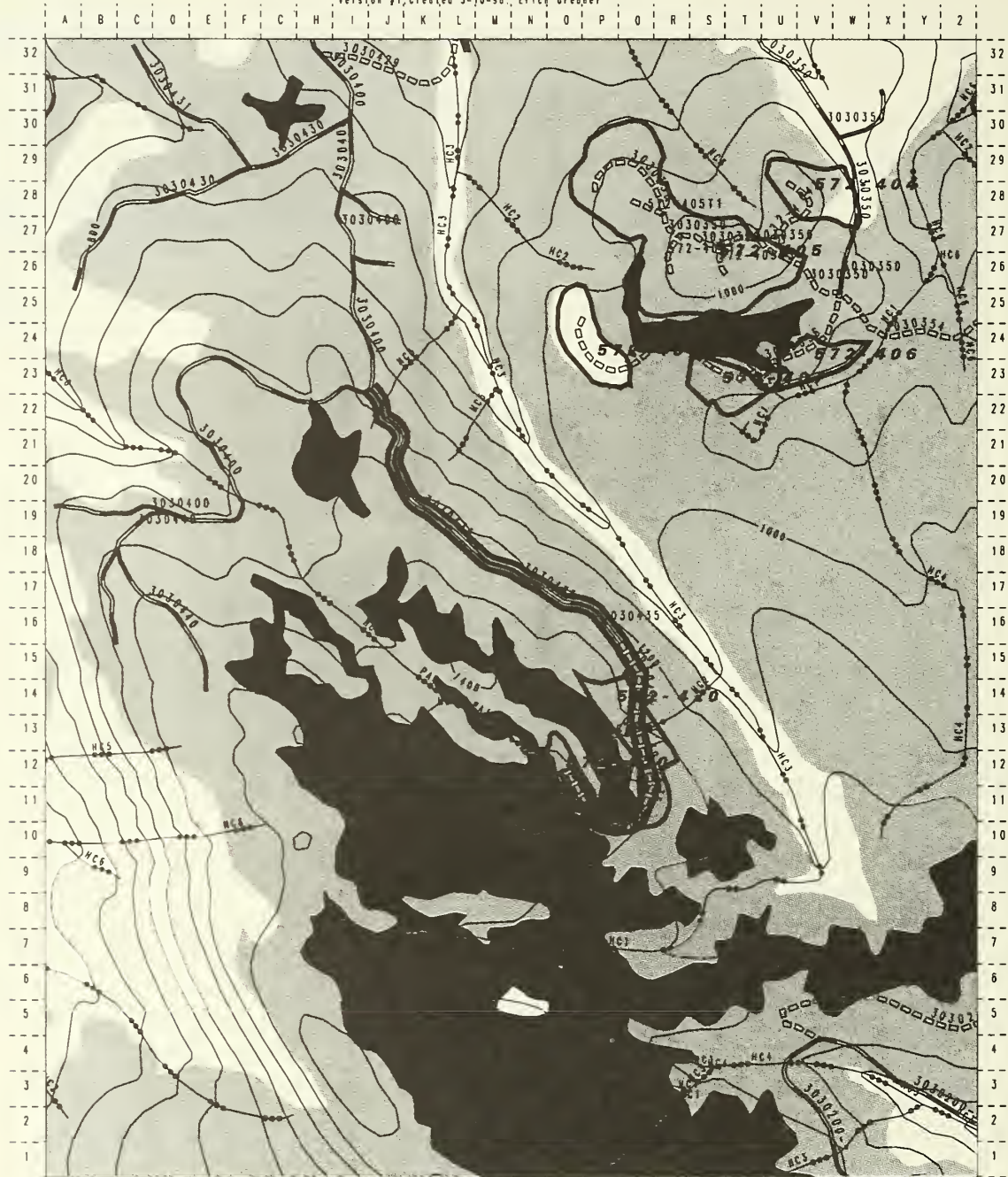
Road #: 3030431 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 26N Photo #'s: 1090-216

NOTES

Luck Lake Project Area Draft Road Card 3030435

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-30-98, Erich Grebner



05/01/98 PAGE 1
Miles
Road Number Miles
3030435 1.19
1.19



0 1 0.2 Miles
Mapscale 1:15840

ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030435</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.19</u>	
<u>N/A</u> Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.40</u>	
<u>New</u> Construction (New or RE)	Beginning M.P. <u>0.68</u>	Length <u>0.51</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		<u>Inactive</u>	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:		Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage M.P. 0.00 to 1.19	
Prohibit:			
Closure Devices:		Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.	
Travel Management Narrative: <u>Close road for wildlife and reduced maintenance costs.</u>			
Design Narrative Information:			
Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.			
Timber/Logging Systems:			
The 3030435 road access timber sale unit 572-420.			
Silviculture:			
No concerns. Access to cultural treatments is provided by 3030400 road. Access will be by foot to accomplish required reforestation work in unit 572-420.			
Wildlife:			
Site-specific and road density concerns.			
Visual/Recreation:			
Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			

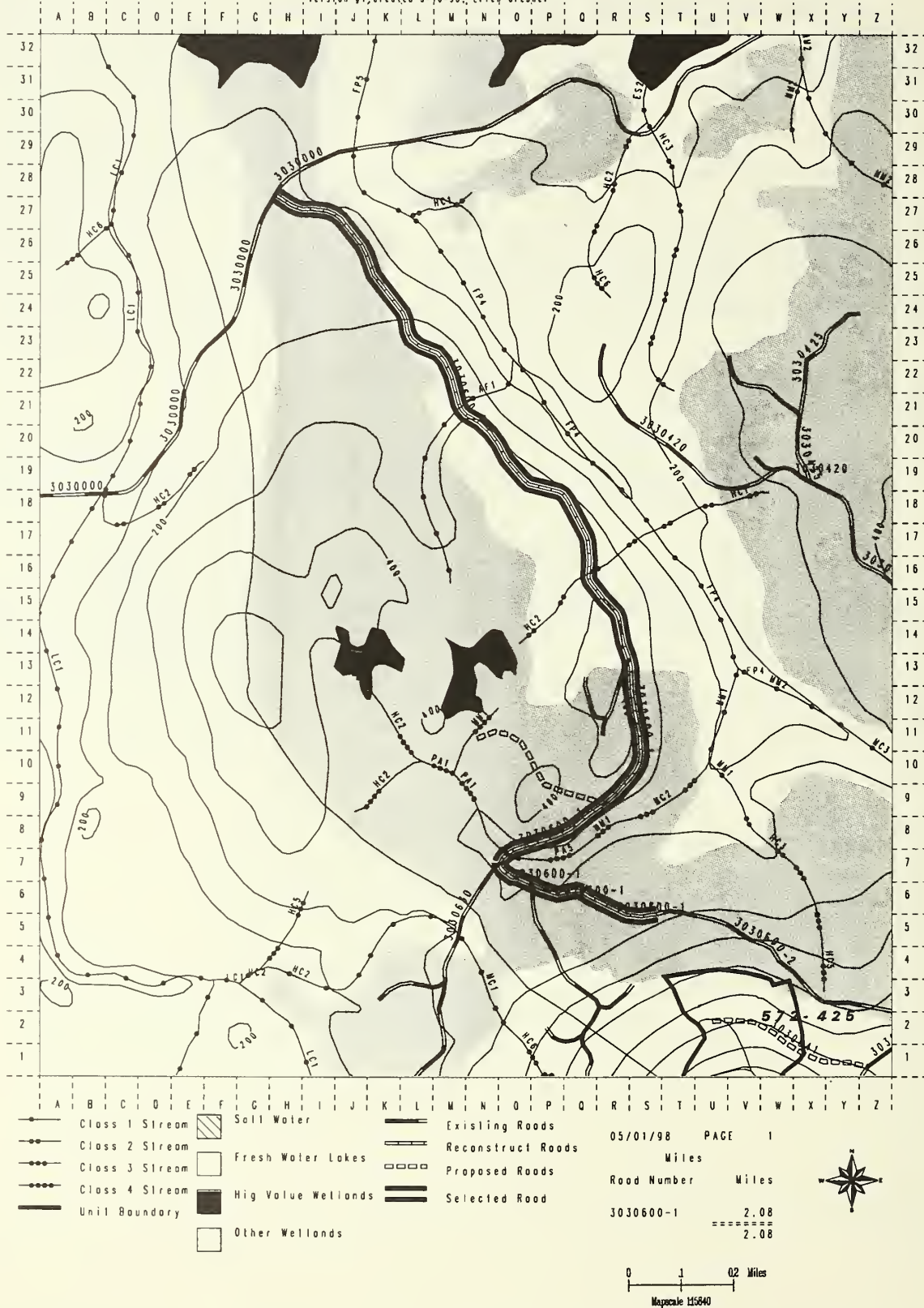
Soils/Water:				
Control placement of excavated material during reconstruction (BMP's 14.7 and 14.12). New construction involves 30 to 40 percent sideslopes across forested wetlands and lesser sideslopes across a short sedge fen (BMP's 12.5, 14.12, and 14.19). Unit 572-420 lies on forested wetlands, and access across wetlands is unavoidable. Helicopter yarding was considered but the value of the wood and the relatively easy road construction does not warrant additional costs (BMP 14.22). The forested wetland and short sedge fen lie just below the summit of a small hill and serves to donate water to downslope resources. Apply 33 CFR BMP's 4, 5, 6, 8, and 14. The 435 road will be closed to vehicular traffic following timber harvest. Road 435 meets the requirements for the silvicultural road exemption from the 404 permit process.				
Road Location Narrative:				
Existing Road and new extension accesses Unit 572-420.				
Wetlands Avoidance:				
The new extension avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible. Moving the route southerly would create more difficult stream crossings in deep notches and require larger cuts within open bogs as side slopes are steeper than the proposed route.				
Rock Pits:				
Stream Crossings:				
No known crossings on reconstruction based on GIS interpretation. One Class III stream crossing on new construction based on GIS interpretation.				
A) MP: unknown	AHMU: Class III, O/W	Channel Type: HC2	BF width	BF depth
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:
Narrative: This stream was originally located between units 572-420A and 572-420B. Recently the units were expanded to include this stream.				

Road #: 3030435 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 26N Photo #'s: 1090-215 & 216

NOTES

Luck Lake Project Area Draft Road Card 3030600-1

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030600-1 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 2.08

RE Construction (New or RE) Beginning M.P. 0.00 Length 2.08

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT
 Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 2
 Intended Purpose and Use: Silvicultural activities and post sale access.

AFRPR Post Sale Status: Active

Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses units 572-411 and 572-425.

Silviculture:

Road accesses units 572-411 and 572-425 for required reforestation work. Road also accesses potential cultural treatments for the near future.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Minor reconstruction. Keep any excavated material out of wetlands or riparian areas (BMP's 12.5, 12.6 and 14.12).

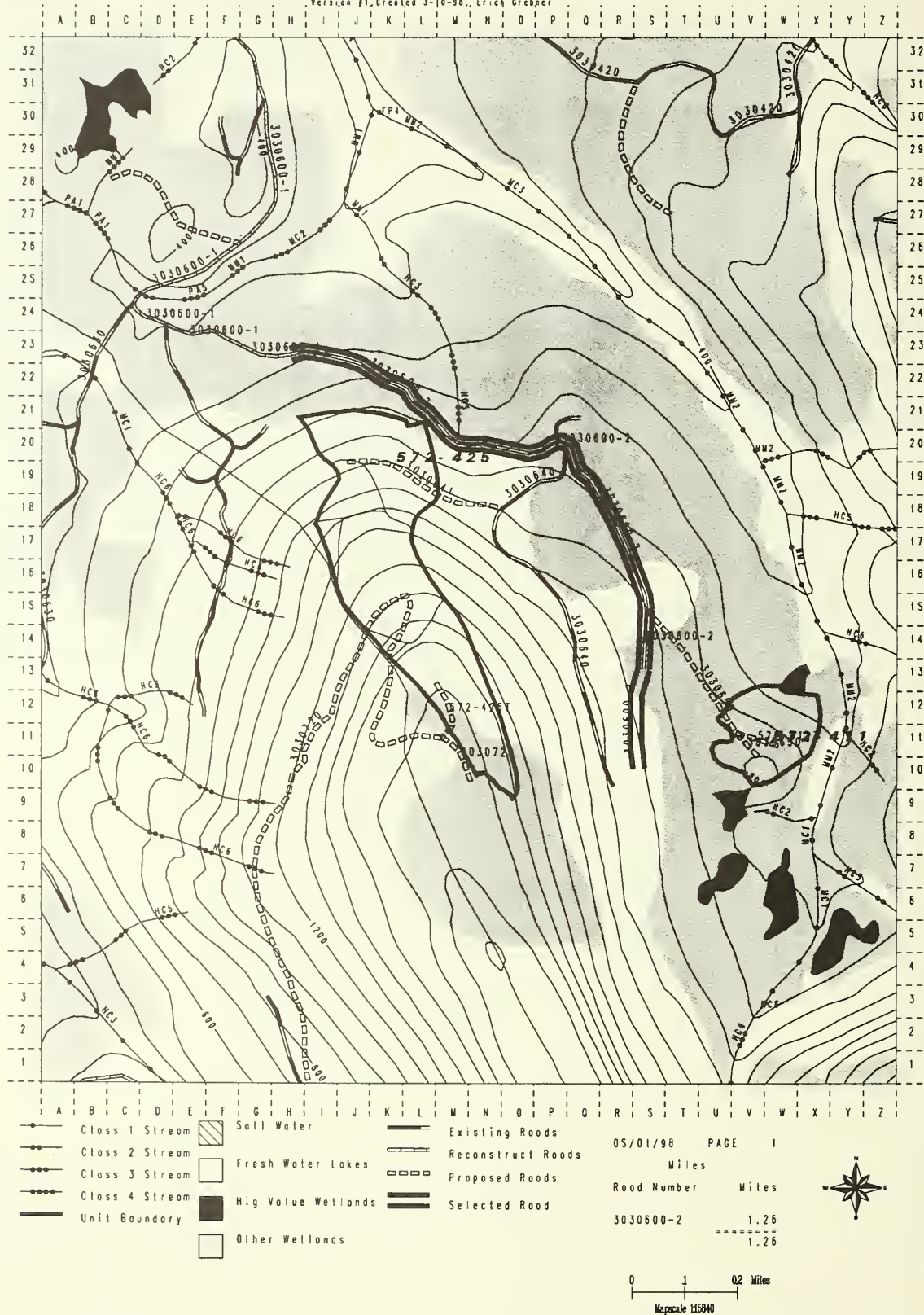
Road Location Narrative:				
Existing Road accesses Units 572-411 and 425. Reconstruct ditch, malfunctioning drainage structures , washed road surface and some brushing .				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings:				
One Class I, one Class II, and one Class IV G/W based on GIS interpretation. The crossings listed below are from the beginning to end of the road segment.				
A) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF depth
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 8/7	Substrate:
Narrative: Close proximity to catalogued coho, pink, and chum habitat.				
B) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF depth
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to catalogued coho habitat.				
C) MP: unknown	AHMU: Class IV G/W	Channel Type: HC	BF width	BF depth
Gradient %		Passage: No	Timing dates: none	Substrate:
Narrative: Water quality stream.				

Road #: 3030600-1 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 25N Photo #'s: 690-156

NOTES

Luck Lake Project Area Draft Road Card 3030600-2

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030600-2</u>	Beginning Terminus M.P. <u>2.08</u>	Ending Terminus M.P. <u>3.34</u>	
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N/A Construction (New or RE)	Beginning M.P. <u>2.08</u>	Length <u>1.26</u>
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>2</u>
Intended Purpose and Use: <u>Silvicultural activities and post sale access.</u>			

AFRPR Post Sale Status:	Active
-------------------------	--------

Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses units 572-411 and 572-425.

Silviculture:

Road accesses units 572-411 and 572-425. No concerns.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Minor reconstruction. Keep any excavated materials out of wetlands or riparian areas (BMP's 12.5, 12.6, and 14.12).

Road Location Narrative:
Existing Road accesses Units 572-411 and 425. Reconstruct ditch, malfunctioning drainage structures , washed road surface and some brushing .
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
There are no known stream crossings on this road segment. There are no fisheries concerns.

Road #: 3030600-2

Map #: Craig D-3 NE

Aerial Photo: Yr. 91

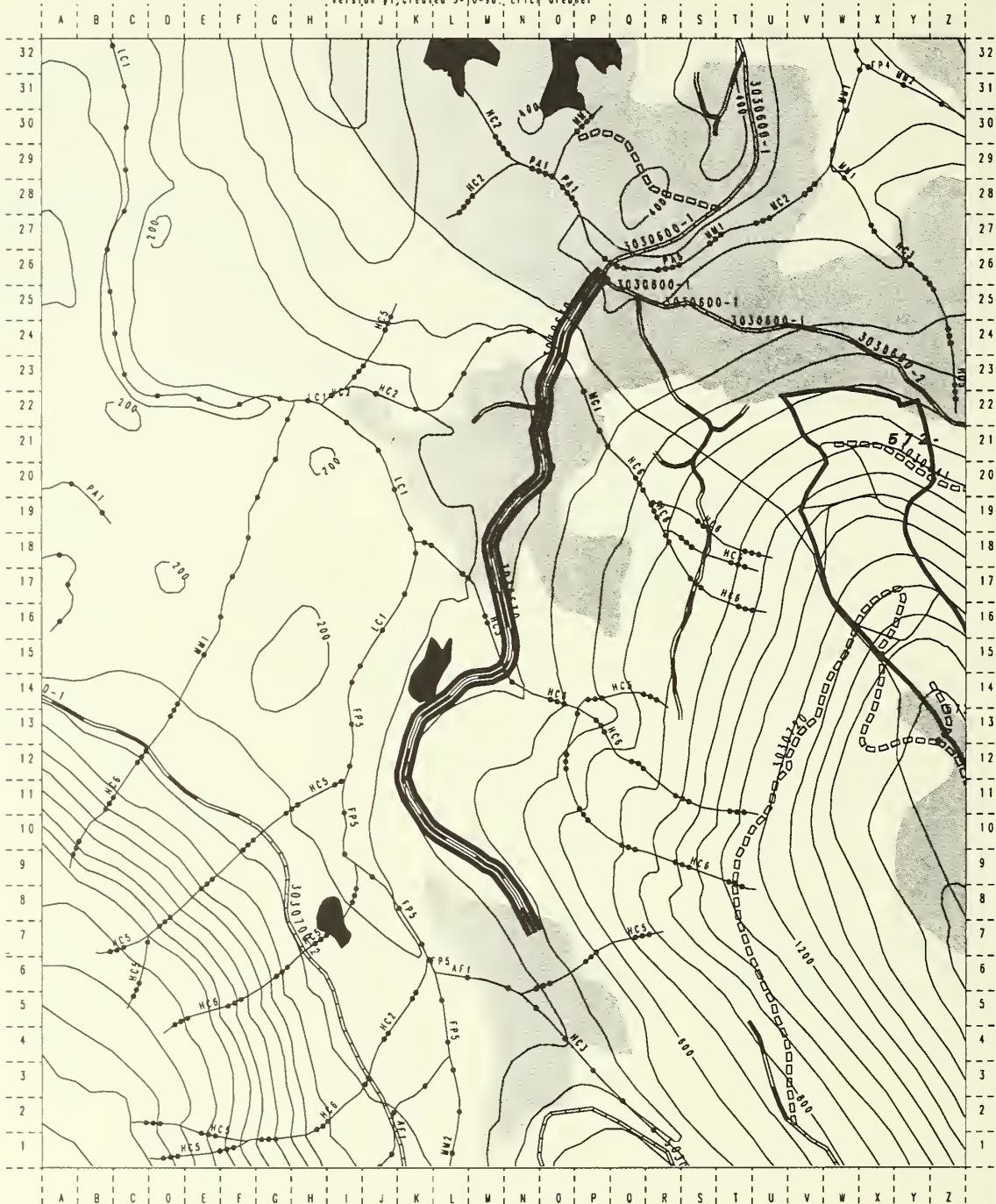
Line 25N

Photo #'s: 690-157

NOTES

Luck Lake Project Area Draft Road Card 3030630

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



- | | | | | | |
|--------|----------------|---|---------------------|------|-------------------|
| —●— | Class 1 Stream | ▨ | Salt Water | — | Existing Roads |
| —●●— | Class 2 Stream | □ | Fresh Water Lakes | — | Reconstruct Roads |
| —●●●— | Class 3 Stream | ■ | High Value Wellands | □□□□ | Proposed Roads |
| —●●●●— | Class 4 Stream | □ | Other Wellands | — | Selected Road |
| — | Unit Boundary | | | | |

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Miles

Road Number Miles

3030630 1.43
===== 1.43

0 1 0.2 Miles
Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030630</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>1.43</u>	
N/A Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>1.43</u>	
Road Management Objectives:			
Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>N/A</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			
AFRPR Post Sale Status:		Inactive	
Management Strategy:			
Encourage:			
Accept:			
Discourage:			
Eliminate:		Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road.	
Prohibit:			
Closure Devices:		Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road. Waterbar steep grades sufficiently to prevent road surface erosion.	
Travel Management Narrative: <u>Close road for wildlife and reduced maintenance costs.</u>			
Design Narrative Information:			
Existing road 14' wide; Design speed 10 M.P.H.; Max grade 20%;			
Timber/Logging Systems:			
No concerns.			
Silviculture:			
Road accesses approximately 100 acres of potential future cultural treatment opportunity. No concerns with planned inactive status.			
Wildlife:			
Close to reduce road density.			
Visual/Recreation:			
No concerns.			
Cultural:			
Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.			
Lands/Minerals/Geology/Karst:			
No known minerals, geology and karst resource concerns.			
Soils/Water:			
Drainage structures prone to plugging should be removed. All structures left in place should be waterbarred (BMP 14.9). Maintain existing alder cover to the extent practicable (BMP 14. 8). Reestablish resident fish passage if blocked by road (BMP 12.5 and 404f guidelines). Timing may be necessary for culvert removal, see fisheries section (BMP 14.6). Discourage vehicular access (BMP 14.22).			

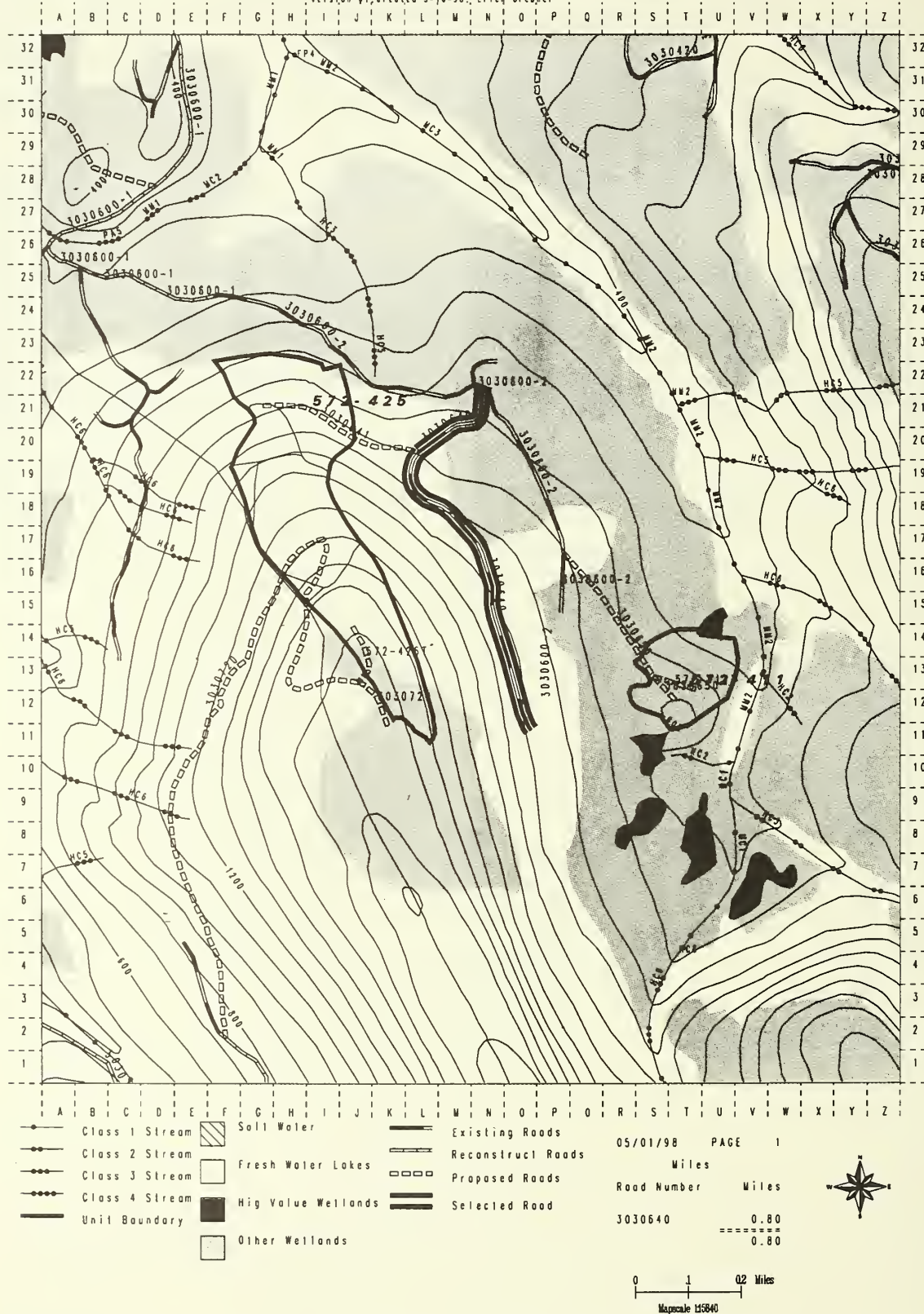
Road Location Narrative:					
Existing Road					
Wetlands Avoidance:					
Existing road.					
Rock Pits:					
Stream Crossings:					
One Class I, one Class II stream crossing based on GIS interpretation. The crossings are listed from the beginning to end of the road segment.					
A) MP: unknown	AHMU: Class I	Channel Type: MC1	BF width	BF Depth	
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Close proximity to catalogued coho and pink habitat.					
B) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF Depth	
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Near Class I coho habitat.					

Road #: 3030630 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 25N Photo #'s: 690-157

NOTES

Luck Lake Project Area Draft Road Card 3030640

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030640</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>3.34</u>	
<u>N/A</u> Construction (New or RE)	Beginning M.P. <u>2.08</u>	Length <u>0.80</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>2</u>
Intended Purpose and Use: <u>Silvicultural activities and post sale access.</u>			

AFRPR Post Sale Status:	Active
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Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses unit 572-425.

Silviculture:

Road accesses unit 572-425 along with potential cultural opportunities. No concern with planned road status.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Minor reconstruction. Maintain drainage and control sidecast of any excavated materials (BMP's 14.8 and 14.12).

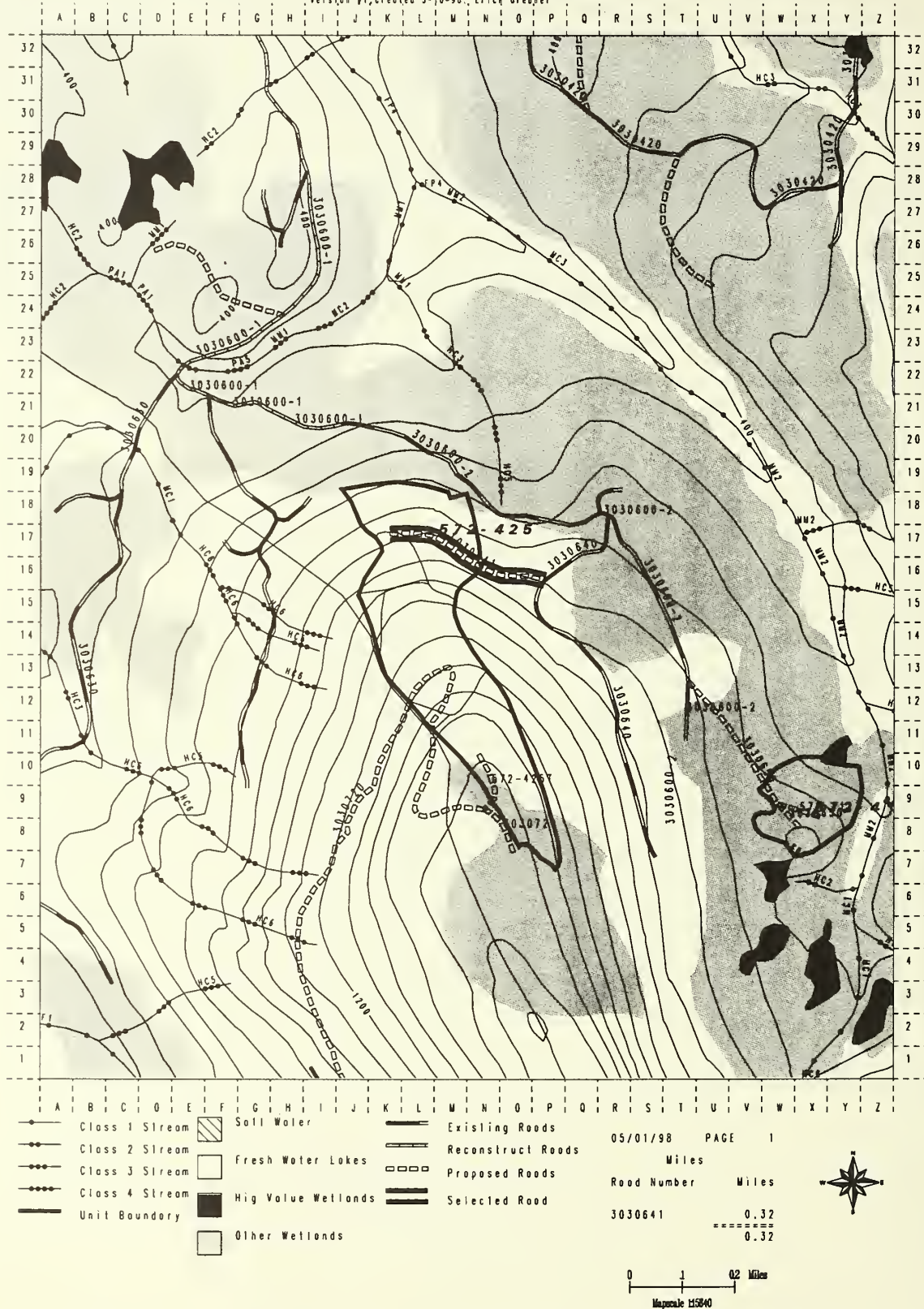
Road Location Narrative:
Existing Road accesses Units 572- 425.
Wetlands Avoidance:
Existing road.
Rock Pits:
Stream Crossings:
There are no known stream crossings on this road segment based on GIS interpretation. There are no known fisheries concerns.

Road #: 3030640 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 25N Photo #'s: 690-157

NOTES

Luck Lake Project Area Draft Road Card 3030641

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erich Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030641 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 0.32

New Construction (New or RE) Beginning M.P. 0.00 Length 0.32

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 1

Intended Purpose and Use: Silvicultural activities.

AFRPR Post Sale Status: Inactive

Management Strategy:

Encourage:

Accept:

Discourage:

Eliminate:

Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.

Prohibit:

Closure Devices:

Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030641 road accesses timber sale unit 572-425.

Silviculture:

Unit 572-425 remains accessible via 3030600-2 and short distance foot travel. No concerns with planned road closure.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

The proposed 3030641 road crosses about 400 feet of second-growth forested wetland before accessing the lower part of unit 572-425. Sideslopes range up to 35 percent. Use BMP's 14.9, 14.12, 12.5 and 14.19 to control placement of sidecast material and control slope drainage. Alternative road locations around the wetland put the road on steeper slopes with greater impacts to water quality. Helicopter yarding of unit 572-425 is considered under some alternatives in this EIS. The wetland lies on a small bench intermediate on the slope. The wetland serves to store and release slope water to a water quality stream downslope. the proposed location across wetlands will have less impact to water quality than crossing the small V-notch downslope. Apply 33 CFR BMP's 4, 5, 8, and 14. The 641 road is proposed for closure following harvest. The 3030641 road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Road accesses Units 572-425.

Wetlands Avoidance:

The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.

Rock Pits:**Stream Crossings:**

There are no known stream crossings on this road segment based on GIS interpretation. There are no known fisheries concerns.

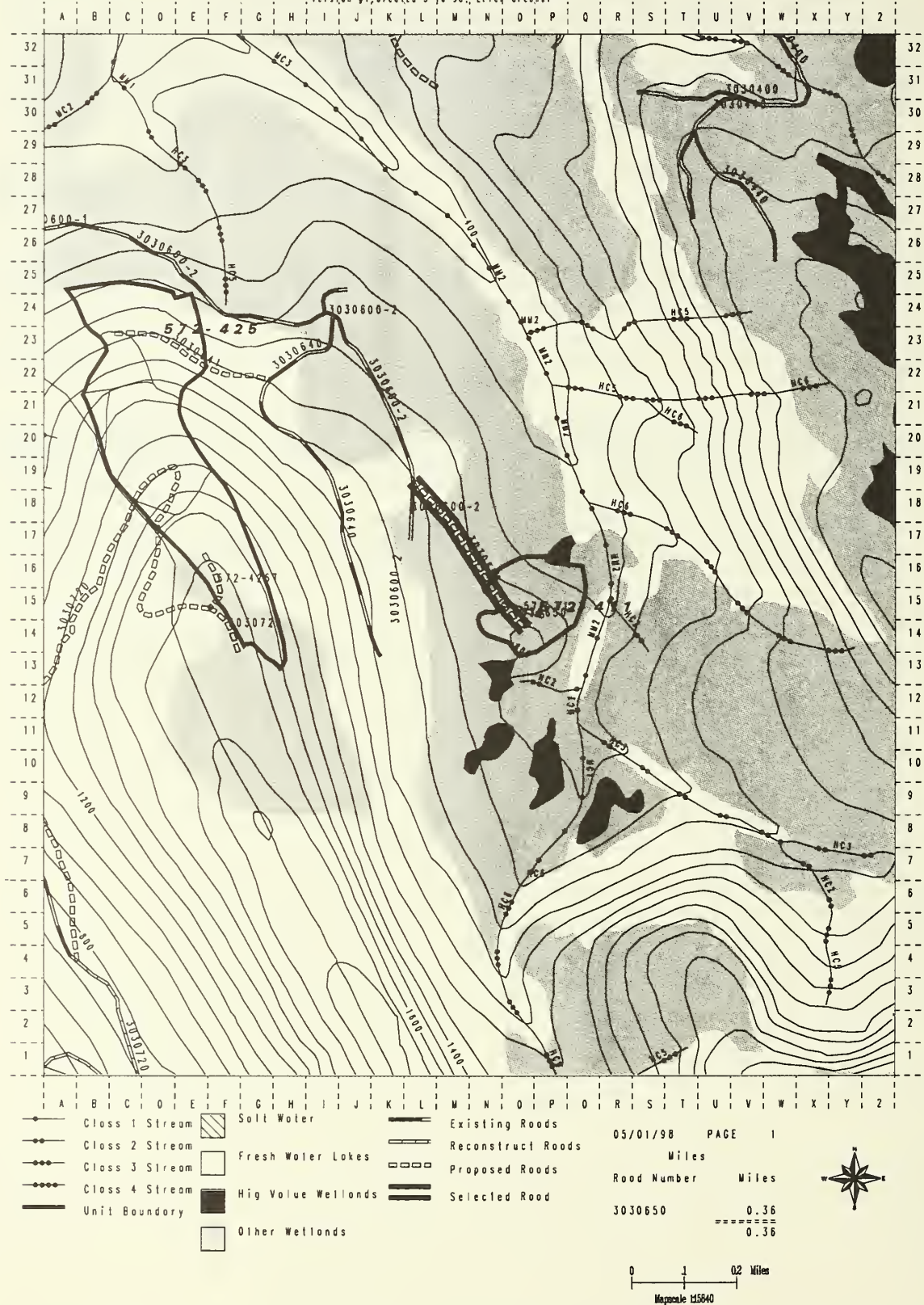
Road #: 3030641 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 25N Photo #'s: 690-157

NOTES

Luck Lake Project Area Draft Road Card 3030650

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grepper



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030650</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>0.36</u>	
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New Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>0.36</u>	
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			

AFRPR Post Sale Status:	Inactive
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Management Strategy:

Encourage:	
Accept:	
Discourage:	
Eliminate:	Pull pipes, create water bars, reseed slopes, and close the road at the beginning of the road. Place in storage.
Prohibit:	
Closure Devices:	Remove approximately 100 ft. of roadbed and construct Tank trap at beginning of road.

Travel Management Narrative: Close road to reduce maintenance costs.

Design Narrative Information:

Design standards are as follows: Road width 14'; Design speed 10 M.P.H.; Max grade 20%; Surface shot rock; minimize ditches and roll grade to drain and construct minimum standard J-hole turnouts.

Timber/Logging Systems:

The 3030650 road accesses timber sale unit 572-411.

Silviculture:

Unit 572-411 is accessible by foot travel for required reforestation work. No concerns with planned road status.

Wildlife:

No concerns.

Visual/Recreation:

Minimize cuts and fills visible to Coffman Cove. No sidecast. Locate rockpit in area unseen from Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

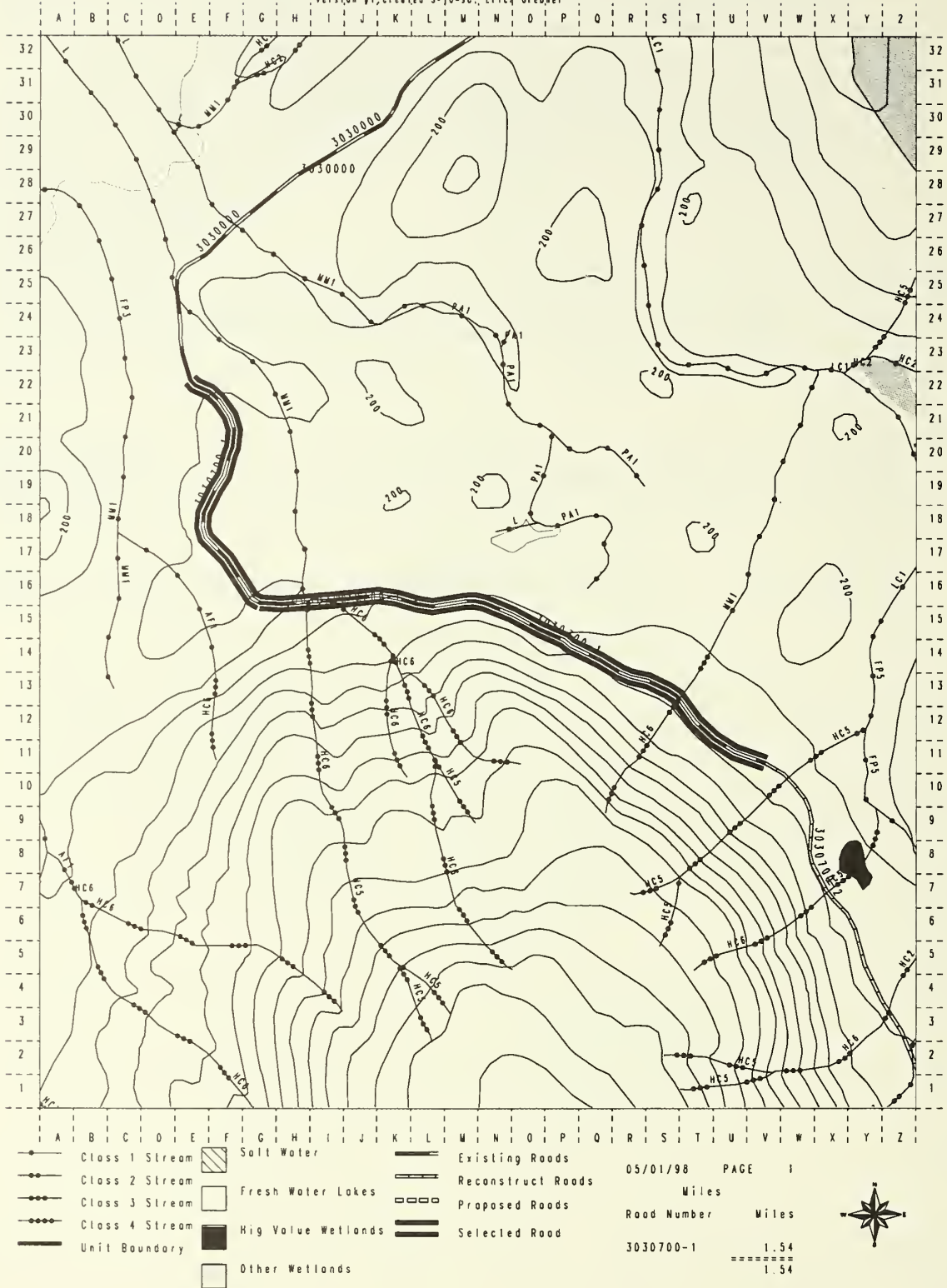
Soils/Water:
The proposed 3030650 route crosses forested wetlands to access unit 572-411 on forested wetlands. Sideslopes are less than 40 percent gradient. The wetlands function as receptors and conveyors of groundwater. Helicopter yarding was considered, however the landing is uphill and the potential benefits do not outweigh the costs. Several small water quality streams occur along the route. Use BMP's 14.9, 14.10, 14.11, 14.12, 14.17, and 14.19 to control placement of sidecast and keep excavated materials out of streams and non-forested wetlands. Sidecast of excavated materials in forested wetlands is unavoidable. Apply 33 CFR BMP's 3, 4, 5, 6, 7, 8, and 14. Road 3030650 is proposed for closure following timber harvest. The 3030650 road meets the requirements for the silvicultural road exemption from the 404 permit process.
Road Location Narrative:
Road accesses Units 572-411.
Wetlands Avoidance:
The route avoids wetlands by running through timbered areas as much as possible. When crossing open bogs, the route is located to minimize cut sections and drainage interruption as much as possible.
Rock Pits:
Stream Crossings:
There are no known stream crossing on this road segment based on GIS interpretation. There are no known fisheries concerns.

Road #: 3030650 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 25N Photo #'s: 690-157

NOTES

Luck Lake Project Area Draft Road Card 3030700-1

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-30-98, Erick Grebner



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. 3030700-1 Beginning Terminus M.P. 0.00 Ending Terminus M.P. 1.54

N/A Construction (New or RE) Beginning M.P. 0.00 Length 1.54

Road Management Objectives:

Funct. Class L Traffic Service Level D Hwy. Safety Act NO Design Veh.: LT

Critical Veh.: LB Maint. Level: 1 Active Sale 2 Post Sale 2

Intended Purpose and Use: Silvicultural activities and post sale access.

AFRPR Post Sale Status: Active

Management Strategy:

Encourage:

Accept:

High clearance

Discourage:

Eliminate:

Prohibit:

Closure Devices:

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities.

Design Narrative Information:

Timber/Logging Systems:

Road accesses unit 572-425.

Silviculture:

Road accesses unit 572-425 along with numerous potential opportunities for near and far future cultural treatments in existing harvest units. No concerns with planned road status.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Minor reconstruction and culvert inlet cleaning. Use BMP 14.12 to keep any sidecast material out of streams and wetlands.

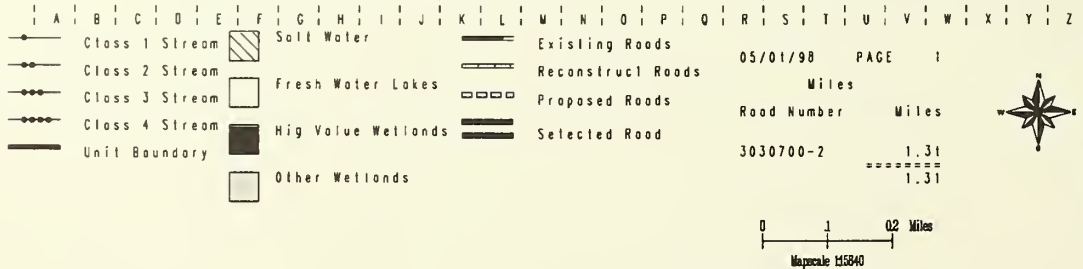
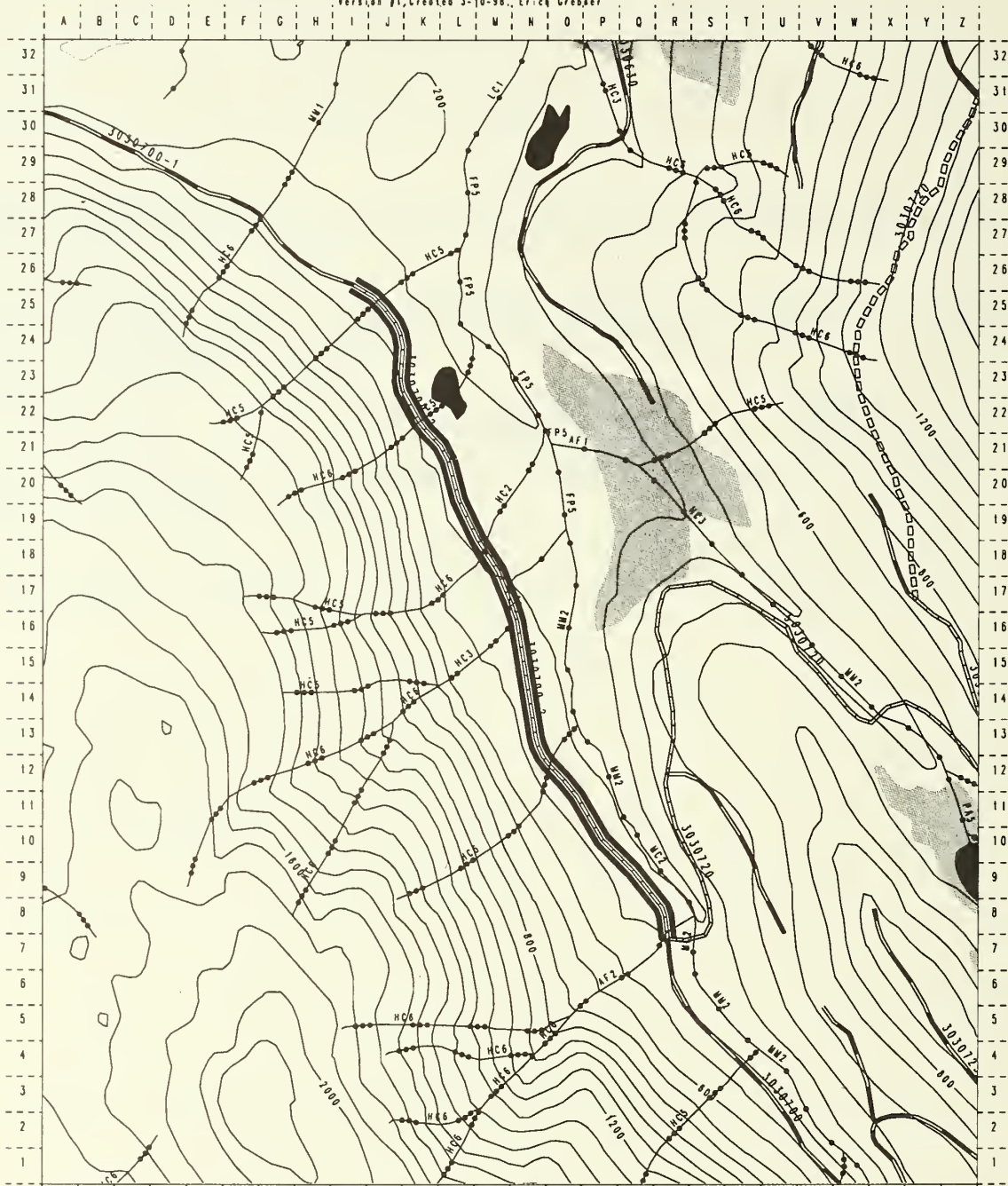
Road Location Narrative:					
Existing Road accesses Units 572- 425.					
Wetlands Avoidance:					
Existing road.					
Rock Pits:					
Stream Crossings:					
One Class I, one Class IV O/W stream crossing based on GIS interpretation. The crossings listed below are from beginning to end of road segment.					
A) MP: unknown	AHMU: Class I	Channel Type: MM1	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Close proximity to coho habitat					
B) MP: unknown	AHMU: Class IV O/W	Channel Type: HC6	BF width	BF depth	
Gradient %	Structure	Passage: No	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Close proximity to coho habitat					

Road #: 3030700-1 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 24N Photo #'s: 990-75

NOTES

Luck Lake Project Area Draft Road Card 3030700-2

Mapscale 1:15840 (4 inch to Mile)
Version #1, Created 3-10-98, Erick Grebaer



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030700-2</u>	Beginning Terminus M.P. <u>1.54</u>	Ending Terminus M.P. <u>2.85</u>	
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RE Construction (New or RE)	Beginning M.P. <u>1.54</u>	Length <u>1.31</u>
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Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>2</u>
Intended Purpose and Use: Silvicultural activities and post sale access.			

AFRPR Post Sale Status:	Active
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Management Strategy:

Encourage:	
Accept:	High clearance
Discourage:	
Eliminate:	
Prohibit:	
Closure Devices:	

Travel Management Narrative: Existing road is to remain open for post sale activities and local established recreation activities. Reconstruct malfunctioning drainage structures, ditches and remove roadside brush.

Design Narrative Information:

Timber/Logging Systems:

Road accesses unit 572-411.

Silviculture:

Road accesses unit 572-411 along with numerous potential opportunities for near and far future cultural treatment in existing harvest units. No concern with planned road status.

Wildlife:

No concerns.

Visual/Recreation:

No concerns.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Minor reconstruction and culvert inlet cleaning. Use BMP 14.12 to keep any sidecast material out of streams.

Road Location Narrative:				
Existing Road accesses Units 572-411 and 425. Reconstruct ditch, malfunctioning drainage structures , washed road surface and some brushing .				
Wetlands Avoidance:				
Existing road.				
Rock Pits:				
Stream Crossings: One Class I, two Class II, and two Class IV O/W stream crossings based on GIS interpretation. The crossings listed below are from beginning to end of road segment.				
A) MP: unknown	AHMU: Class IV	Channel Type: HC5	BF width	BF Depth
	O/W			
Gradient %		Passage: No	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to coho habitat; just south of intersection with 3030715.				
B) MP: unknown	AHMU: Class IV	Channel Type: HC6	BF width	BF Depth
Gradient %	Structure	Passage: No	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to coho habitat.				
C) MP: unknown	AHMU: Class II	Channel Type: HC2	BF width	BF Depth
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to coho habitat.				
D) MP: unknown	AHMU: Class I	Channel Type: AF1	BF width	BF Depth
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Class II upstream; close proximity to coho habitat.				
E) MP: unknown	AHMU: Class IV	Channel Type: HC5	BF width	BF Depth
	O/W			
Gradient %	Structure	Passage: No	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to coho habitat.				
F) MP: unknown	AHMU: Class II	Channel Type: AF2	BF width	BF Depth
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:
Narrative: Close proximity to coho habitat; near intersection with 3030720.				

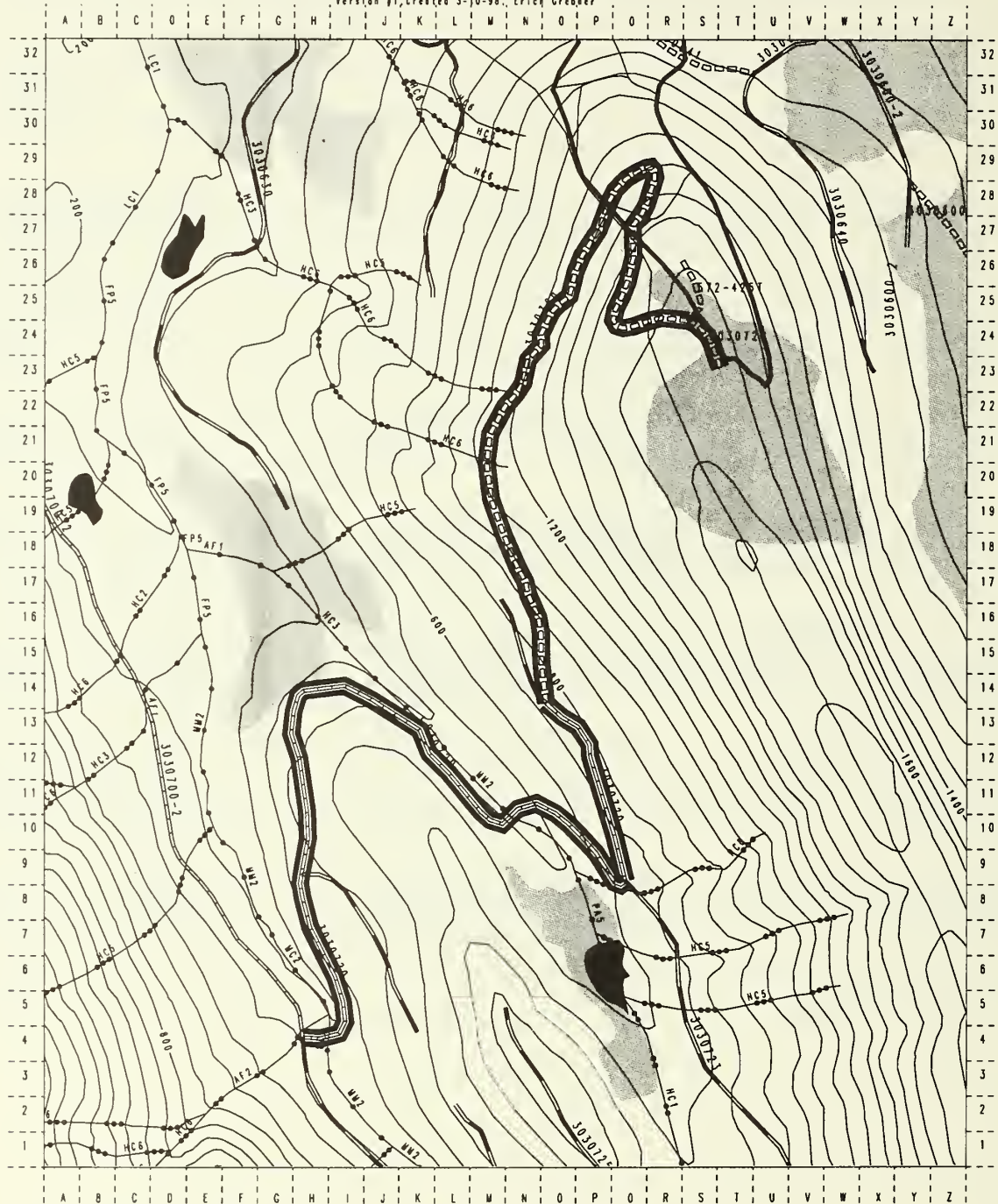
Road #: 3030700-2 Map #: Craig D-3 NE Aerial Photo: Yr. 91 Line 24N Photo #'s: 990-75

NOTES

Luck Lake Project Area Draft Road Card 3030720

Mapscale 1:15840 (4 inch to Mile)

Version #1, Created 3-10-98, Erich Grebe



- | | | |
|----------------|---------------------|-------------------|
| Class 1 Stream | Salt Water | Existing Roads |
| Class 2 Stream | Fresh Water Lakes | Reconstruct Roads |
| Class 3 Stream | High Value Wetlands | Proposed Roads |
| Class 4 Stream | Other Wetlands | Selected Road |
| Unit Boundary | | |

05/01/98 PAGE 1

Miles

Road Number Miles

3030720 3.41

3.41

0 1 0.2 Miles

Mapscale 1:15840



ROAD MANAGEMENT OBJECTIVES AND ROAD CARD

Road No. <u>3030720</u>	Beginning Terminus M.P. <u>0.00</u>	Ending Terminus M.P. <u>3.41</u>	
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RE Construction (New or RE)	Beginning M.P. <u>0.00</u>	Length <u>1.72</u>	
New Construction (New or RE)	Beginning M.P. <u>1.72</u>	Length <u>1.69</u>	

Road Management Objectives:

Funct. Class <u>L</u>	Traffic Service Level <u>D</u>	Hwy. Safety Act <u>NO</u>	Design Veh.: <u>LT</u>
Critical Veh.: <u>LB</u>	Maint. Level: <u>1</u>	Active Sale <u>2</u>	Post Sale <u>1</u>
Intended Purpose and Use: <u>Silvicultural activities.</u>			

AFRPR Post Sale Status:	Inactive
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Management Strategy:

Encourage:	
Accept:	
Discourage:	
Eliminate:	Place in storage
Prohibit:	
Closure Devices:	Pull bridge and pipes . Construct waterbars at strategic sections and steep grades.

Travel Management Narrative: Reconstruct malfunctioning drainage structures, ditches and remove roadside brush. Close by removing drainage structures and constructing water bars. Close to reduce maintenance and to reduce wildlife impacts.

Design Narrative Information:

Timber/Logging Systems:

The 3030720 road accesses timber sale unit 572-425.

Silviculture:

The 3030720 road accesses timber sale unit 572-425 along with potential future cultural treatment opportunities. Unit 572-245 remains accessible from 3030600 road with short foot travel. No concern with planned road status.

Wildlife:

Close to reduce road density.

Visual/Recreation:

Locate any new rockpits to not be visible from Sweetwater Lake or Coffman Cove.

Cultural:

Road is outside of high probability areas for cultural resources. Post-construction monitoring on a small sample of roads will be implemented.

Lands/Minerals/Geology/Karst:

No known minerals, geology and karst resource concerns.

Soils/Water:

Reconstruction consists of ditch cleaning and bridge replacement. Use BMP's 14.12 and 14.7 to avoid sidecasting any excavated material in streams or on slopes in excess of 60 percent. New construction crosses sideslopes ranging from 40 to 70 percent with approximately 200 feet on slopes over 67 percent. Use BMP's 14.6, 14.7, 14.8, 14.12, and 14.19 to maintain slope stability. Involve soil scientist or geotechnical specialist in the plan-in-hand review of the road. Cutslope stabilization may be difficult. Two small forested wetlands on topographic summits will be affected by this road. The wetlands store and donate water to downstream resources. Due to grade and slope constraints the wetlands provide the most stable site on the hillslope (BMP's 14.1 and 14.2). Helicopter yarding of unit 572-425 is considered under some alternatives in this EIS. Due to future access opportunities the construction of the 3030720 road to this point is important. Use BMP's 12.5, 14.12, and 14.19 to minimize impacts to wetlands. Apply 33 CFR BMP's 4, 5, 6, 8, and 14 to preserve wetland function. The 3030720 road will be closed to vehicular traffic following timber harvest. The 3030720 road meets the requirements for the silvicultural road exemption from the 404 permit process.

Road Location Narrative:

Existing Road accesses Units 572-411 and 425. Reconstruct ditch, malfunctioning drainage structures, washed road surface and some brushing.

Wetlands Avoidance:

Existing road.

Rock Pits:**Stream Crossings:**

One Class I on new construction, one Class IV G/W on reconstruction. The crossings listed below are from the beginning to end of the road segment.

A) MP: unknown	AHMU: Class I	Channel Type: MM2	BF width	BF depth	
Gradient %	Structure	Passage: Yes	Timing dates: 6/15 to 9/1	Substrate:	
Narrative: Located on new construction; coho habitat.					
B) MP: unknown	AHMU: Class IV G/W	Channel Type: HC6	BF width	BF Depth	
Gradient %	Structure	Passage: No	Timing dates: none	Substrate:	
Narrative: Located on reconstruction.					

Road #: 3030720

Map #: Craig D-3 NE

Aerial Photo: Yr. 91

Line 24N

Photo #'s: 990-75

Aerial Photo: Yr. 91

Line 25N

Photo #'s: 690-157

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